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REPORT

OF THE

NEW JERSEY STATE MUSEUM

1908

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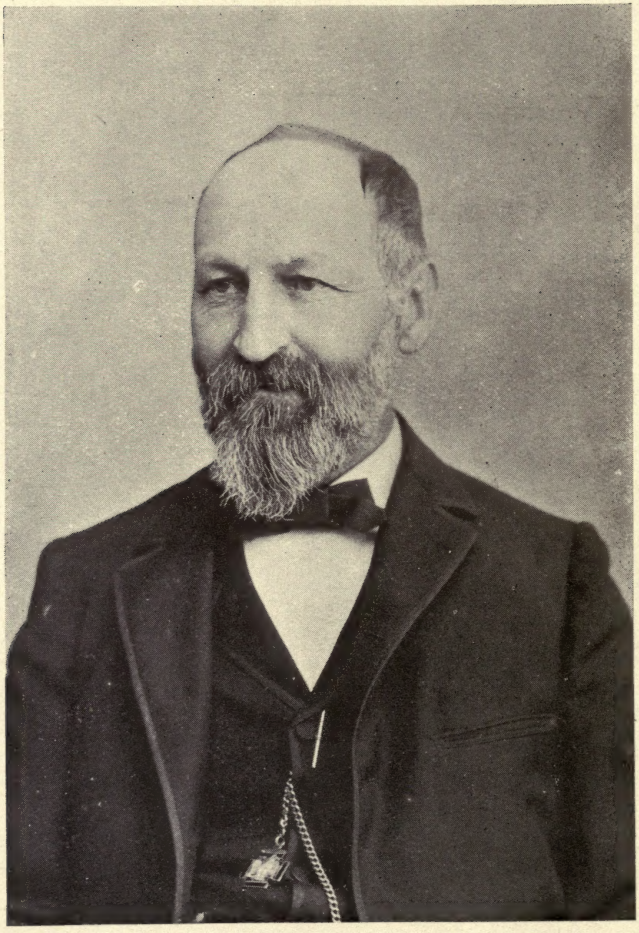

SILAS R. MORSE, Curator.

ANNUAL REPORT

OF THE

NEW JERSEY STATE MUSEUM

INCLUDING A REPORT OF

Stone, Witmer

THE BIRDS OF NEW JERSEY

THEIR NESTS AND EGGS

And Notes on New Jersey Fishes, Amphibians and Reptiles

1908

TRENTON, N. J.:
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Catalog as
The birds of New Jersey,
by Witmer Stone.
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PART I.

COMMISSIONERS OF THE NEW JERSEY STATE MUSEUM.

STATE SUPT. OF PUBLIC INSTRUCTION, CHARLES J. BAXTER, *President.*

STATE GEOLOGIST, HENRY B. KÜMMEL, *Secretary.*

PRESIDENT STATE BOARD OF AGRICULTURE, E. B. VOORHEES.

PRESIDENT OF THE SENATE, THOMAS T. HILLERY.

SPEAKER OF THE HOUSE OF ASSEMBLY, FRANK B. JESS.

SILAS R. MORSE, *Curator.*

Heads of the Several Departments of the New Jersey State Museum.

C. J. BAXTER, STATE SUPERINTENDENT OF PUBLIC INSTRUCTION,
Educational.

E. B. VOORHEES, RUTGERS COLLEGE,
Agriculture.

HENRY B. KÜMMEL, STATE GEOLOGIST,
Geology.

JOHN C. SMOCK, EX-STATE GEOLOGIST,
Forestry.

JOHN B. SMITH, STATE ENTOMOLOGIST,
Entomology.

JAMES T. MORGAN, DEPUTY OF BUREAU OF LABOR STATISTICS,
Manufactures.

WILLIAM H. WERNER, *Taxidermist of Museum.*
HERBERT M. LLOYD, SECRETARY OF GEOLOGICAL SURVEY,
Archæology.

Curator's Report.

In presenting our annual report for 1908 we are carrying out the plan laid out by the Commission and the Curator, to make the Museum reports on the same plan as the Museum was established—purely educational.

This report treats of the "Birds of New Jersey, their Nests and Eggs." We feel that no subject could be taken for the report that would be more interesting and beneficial in the cause of education than this. It will educate the children to love and protect their winged friends, not destroy them.

The subject-matter of "The Birds, their Nests and Eggs," has been prepared by Mr. Witmer Stone, Curator of the Academy of Natural Sciences of Philadelphia, a gentleman having a national reputation as a naturalist. His authority on this subject is surpassed by none. The subject-matter has been presented in such a manner that it will be interesting as well as instructive.

The part in our last Museum report of 1907, "The Mammals of New Jersey," was contributed by Mr. Stone. The report has proven a great success.

To the Bird Report are added some notes of the New Jersey Fishes, Amphibians and Reptiles by Henry W. Fowler.

WHERE THE REPORTS ARE DISTRIBUTED.

The Museum reports have been sent to all of the New Jersey public libraries, school libraries, colleges, museums, historical societies, the State officials and those interested in natural history. Besides copies have been sent to all of the United States libraries and departments interested at Washington, and to a large number of the museums, colleges and scientific institutions in the United States, and some in

foreign countries, from which we have received many valuable works in exchange. We have a large number of letters from prominent persons commending our reports.

VISITORS.

The number of visitors to the Museum has increased during the past year. Had we room to display our exhibits in the proper manner, many more would visit it. Many students from the State Schools and the public schools have improved the chance to come and study the different exhibits. It is the desire of the Commission and the Curator to make the Museum an educational one, so that students from all parts of the State can have a place to study the natural history as well as the best work done in the public schools of the State. The number of students who have improved this opportunity has greatly increased in the past year.

NEW CABINETS AND EXHIBITS.

The new cabinets have given the geological department room to better display the many New Jersey specimens it has had in storage for many years.

The collection of marine shells and shell fish has had many additions to it during the past year, and has become an interesting part of the Museum. Professor John B. Smith, the State Entomologist, is still adding to our valuable insect collection. To him is due the credit for this fine exhibit of insects.

THE NEEDS OF THE MUSEUM.

The State Museum needs more room. The large display hall is crowded, so that many of the specimens in it are not properly displayed, and many more cannot be unpacked. Our Educational and Social Economy Exhibits have only a small part displayed, and one small room in which the largest part is contained has to be kept locked to keep the exhibits from being stolen.

Much more of these exhibits are stored where they cannot be seen. These exhibits are very interesting and instructive, containing, as they do, a large part of the School Exhibits that were seen at seven expositions, namely: Philadelphia Centennial Exposition in 1876; New Orleans in 1885; Columbian Exposition at Chicago, 1893; Pan-American Exposition at Buffalo in 1901; Inter-State and West Indian at Charlestown in 1901-2; Louisiana Purchase Exposition at St. Louis, 1904, and the Jamestown Ter-Centennial Exposition at Jamestown, 1907.

The educational value of these exhibits would be very great in showing the advancement the State has made in her schools for the past thirty-one years, if it could be properly displayed.

At Jamestown the Educational Exhibit was pronounced one of the most valuable ever shown at any of the expositions. It should be so displayed in the State Museum that the State could get the full benefit of it.

The Museum Commission is anxious to have a historical department. With that received from Jamestown, and what has been promised to be presented to that department, a good commencement could be made, and in a short time it would have a collection the State would be proud of, besides saving many valuable relics from going into other museums outside of the State.

ADDITION TO THE MUSEUM'S SPECIMENS BY PURCHASE.

BIRDS.

Mounted Rough-Legged Hawk.
Mounted Loon.
Mounted Red-Shouldered Hawk.
Mounted Merganser.
Mounted Marsh Hawk.
Mounted Harlequin Duck.
Mounted King Duck.
Mounted Tern.
Four mounted Snipe.
Mounted Coot.
Mounted Short-Eared Owl.
Mounted Downy Woodpecker.
Mounted Crossbill.
Mounted Pied-Billed Grebe.
Mounted Whistler Duck.
Two mounted Whooping Cranes, nest and eggs.
Three Canadian Grouse.
Plack mounted Dusky Duck.
Mounted Ruddy Duck.
Mounted Old Squaw Duck.
Two Plack mounted American Eider Ducks.
Two mounted Blue-Winged Teal.
Three mounted Green-Winged Teal.
Group mounted Cooper's Hawks, nest, eggs and young.
Group mounted Laughing Gulls, nest, eggs and young.
Group mounted Wilson's Terns and young.
Group mounted Meadow Larks, nest and eggs.
Group mounted White-Throated Sparrows.
Mounted Golden Eagle.
Mounted Blue Grosbeak.
Mounted White-Crowned Sparrow.

FISH.

Plack of two mounted Brook Trout.
Mounted Sun Fish.
Mounted Lake Trout.
Mounted Ten-and-one-half-pounds Land-Locked Salmon.
Mounted Black Fish.
Mounted Sun Fish.
Mounted Cod Fish.

ANIMALS.

Mounted Black Bear and Cub.
Mounted Moose head.
Mounted Caribou head.
Mounted Hedge-hog or Porcupine.

PART II.

THE BIRDS OF NEW JERSEY

By WITMER STONE,

Curator Academy of Natural Sciences, of Philadelphia.

Fellow American Ornithologists' Union.

PREFACE.

The birds of any State are of more importance to its citizens than are any of the other vertebrates. It is not their value as food, since the game birds are few in number and are shot mainly for sport, but their value as destroyers of insects, that demands our attention.

In nature's scheme birds are one of the greatest checks on the increase of insect life, and were they to be removed and the balance upset, noxious insects would increase at such a rate that all crops and all vegetation would be threatened with extermination. Anyone familiar with the ravages of the Gypsy Moth, the Migratory Grasshopper, and other similar pests, can realize what insects can accomplish when they get beyond control, and when we realize that one Chickadee eats in one day 30 female canker worms, which would have laid 5,550 eggs, and that one Meadow Lark devours at least 1,500 grasshoppers a month,* we begin to realize what disaster we should face were our birds destroyed.

Our birds, moreover, need protection, since nearly every activity of man tends to their destruction. Aside from the actual killing of birds, which is governed by law; the destruction of forests; the alteration of rural districts into villages and towns; the draining of swamps; clearing away of underbrush, etc., etc., all indirectly affect bird life, driving many species away, and decreasing the numbers of others by reducing the area available to them.

The best method of protecting the birds is to increase the interest in birds and bird study among the citizens of the State, especially in schools, for the more school children who are made familiar with the value of bird protection, the easier will it be to ensure good legislation in the future, and to enforce this legislation when enacted.

For this purpose the present report has been prepared. The aim has been to present keys and descriptions that will enable anyone to

* Actual results of investigation of birds' stomachs by the United States Department of Agriculture.

identify birds that he may see, to give a brief sketch of the more characteristic habits of the common species, and at the same time to include such facts and records on the distribution of all species as will make the report a thoroughly up-to-date list of the birds of the State. The measurements have been taken from Ridgway's "Manual of North American Birds," and in the keys some points have been taken from this work and from Chapman's "Hand Book," though they are mainly original. The measurements of eggs are from Reed's "North American Birds' Eggs." The facts upon which the statements on food habits are based are from the publications of the United States Department of Agriculture, while the descriptions are drawn up from specimens in my own collection or that of the Academy of Natural Sciences of Philadelphia, to which institution I am also indebted for the use of the volumes of Wilson and Audubon, from which most of the plates have been reproduced. To the National Association of Audubon Societies, through the president, Mr. William Dutcher, I am indebted for the use of a number of excellent half-tones prepared for the Association's Educational Leaflets.

All the published lists and papers relating to the New Jersey birds have been consulted, as well as manuscript data received from W. DeWitt Miller, Samuel N. Rhoads, R. C. Caskey, C. J. Hunt, Henry W. Fowler, H. Walker Hand, W. B. Evans, George S. Morris, A. P. Willets, C. J. Pennock, William L. Baily, J. A. G. Rehn, H. H. Hann, J. P. Callender, J. H. Patterson, P. B. Philipp, F. M. Chapman, Dr. Jonathan Dwight, Jr., Henry Hales, W. A. Babson, Dr. William C. Braislin, B. S. Bowdish, W. H. Werner, W. W. Justice, Jr., R. C. Harlow, A. H. Phillips, Dr. Wm. E. Hughes, Stewardson Brown, and D. E. Harrower, to all of whom the writer expresses his obligation. To Mr. S. R. Morse, Curator of the New Jersey State Museum, I am also under obligations for many courtesies and suggestions.

WITMER STONE,
Academy of Natural Sciences,
Philadelphia, Pa.

October 31st, 1908.*

* Additional records have been added up to June 15th, 1909, as the work was passing through the press.

The Destruction and Protection of Our Birds.

As an introduction to our chapter on "Bird Protection" we cannot do better than to quote from Mr. H. W. Henshaw, of the United States Department of Agriculture. He says: "As objects of human care and interest birds occupy a place filled by no other living things, and the various movements to protect and foster them would be fully justified were there no returns other than æsthetic. Only the thoughtless and the ignorant still hold that the graceful forms and beautiful plumage of these masterpieces of nature serve their highest purpose when worn on a hat for a brief season, to be then cast aside and forgotten, the plumage dimmed and faded, the beautiful songs quenched forever."

Many of man's activities as practiced in this country tend toward the extermination of bird-life and for this reason it is of the utmost importance for us to encourage and foster every move for their protection in order to counterbalance, as far as possible, the destructive tendencies. The causes most potent in destroying birds and the results that they have produced may be grouped as follows:

(1) *Direct slaughter of birds (a) for the millinery trade.*—The absurd and barbarous habit of wearing dead birds or parts of them for "ornament" is something in which all true women should be ashamed to participate. Every bird, every aigrette plume, every Owl, Pelican or Eagle feather, every Grebe's breast, etc., means the slaughter of a beautiful bird and usually the starving of a family of young, as most millinery collecting is done at the breeding season, when the plumage is at its best.

In New Jersey the women who encourage this slaughter by wearing bird plumage have been responsible for the extermination of the American Egret, Snowy Heron, Little Blue Heron and Least Tern, all of which used to breed regularly along our coast, but to-day are but the rarest stragglers from the south. In addition the Common Tern and Laughing Gull have been so reduced in numbers that but a couple

of colonies of each are now known on our coasts. Details of this extermination will be found under these several species.

(b) Slaughter for sport.—The shooting of Ducks, Geese, Shorebirds, Quail and Grouse has always been regarded as legitimate sport. Unfortunately with the increase of population numbers of gunners take the field who are utterly lacking in the appreciation of true sport. First come the Italians who, educated for generations in the belief that everything that flies is legitimate game, shoot down Warblers, Sparrows and Chickadees with as much satisfaction as a true sportsman would kill a Pheasant. But little better are the American citizens boasting of their superiority but who do not hesitate to shoot out of season or to slaughter Clapper Rails on the fall tides when the birds cannot escape, just to see how many they can kill. This sort of thing is bound to tell and is now telling upon the numbers of our wild birds.

We must recognize two facts in dealing with game legislation—first, that the number of gunners is vastly increased; second, that the number of many game birds is vastly decreased. This is due to the fact that the breeding grounds of many of the Ducks in Iowa and the Dakotas have been entirely drained and cultivated and the birds deprived of a place to nest, and now, in opening up the Saskatchewan country to railroads and settlers, the same thing is being done there. All the Ducks that bred in these areas are decreasing rapidly, and only those that breed in the far north, like Brant, etc., are holding their own. Among the shore birds the same thing is seen, but here it is the unlimited shooting all along the line of migration that is doing the damage. The Golden Plover and Eskimo Curlew, for instance, breed in the far north and winter in the Argentine Republic. They are shot by the South American sportsmen all winter and are targets for the gunners of North America during both the spring and autumn flights.

The changed conditions and increase in gunners demand radical legislation, as the birds simply *cannot* exist for many years under present conditions. Spring shooting must stop, and shooting must be everywhere restricted to those who are willing to shoot in moderation for their own use. The marketing of wild game must eventually stop or the supply will be exhausted.

Opposition to legislation toward these ends is simply due to selfishness on the part of those who refuse to look to the future and are only interested in their personal gain.

The shooting of small insectivorous birds is, of course, wholly illegal, and should be suppressed everywhere as it usually is. The recognition of the Flicker as a game bird is utterly unwarranted. It is one of our most important insectivorous birds and should be rigidly protected, as also the Dove and Killdeer. Careless and unlimited gunning has exterminated the Wild Pigeon and Heath Hen, also apparently the Eskimo Curlew, while the Killdeer, Woodcock and Wood Duck are rapidly going the same route, and Quail are only perpetuated by importing them from elsewhere! Unless the people wake up to the fact that changed conditions demand less gunning and more restricted gunning our descendants will have nothing to shoot.

(2) *Indirect influences.*—Man is so busy making all the money he can from natural resources and unclaimed land that he never stops to consider what effect he is producing on nature. The spread of towns and cities, the establishment of resorts along the whole seaboard, the destruction of forests and draining of swamps all tend to decrease bird-life. Some few species like the Robin take naturally to civilization, but many others are driven away forever. From our shore the Willet, Piping and Wilson's Plovers, Oyster-catcher, Skimmer, Avocet, Stilt, and other species are gone forever as breeding birds, and are indeed for the most part rare even as stragglers. All crowded out by the summer population of our coast strip and doubtless by the careless gunning of these summer visitors.

Birds that have disappeared inland are notably the Mockingbird and the Summer Tanager.

(3) *Introduced birds.*—The English Sparrow has played an important part in driving various familiar birds away from our towns, such as the House Wren, Bluebird, etc. While the Sparrows are often openly hostile to our native birds, the result is no doubt mainly due to the fact that the Sparrows are resident and retain continual possession of all available nesting sites in bird boxes, buildings, etc. They have, so to speak, taken the place of our native birds, for as there is probably only support for a certain number of individual birds in a given area the Sparrows have ousted the native species in the struggle for existence so far as towns are concerned. Not content with the lesson learned from the Sparrow we now have the European Starling increasing rapidly and spreading all over the State. He bids fair to be almost as big a nuisance. So too the English Pheasant is being introduced, carrying with it a disease that is said to be fatal to our native Ruffed Grouse.

Experience has shown that it is never desirable to introduce foreign birds or animals as they always have an injurious effect upon the native fauna.

(4) *Egg collecting.*—The State should at all times permit properly accredited persons to collect specimens of birds or nests for scientific purposes. All our knowledge of birds, their value, etc., has been derived from ornithologists who have, of course, been compelled to collect specimens. Unfortunately, however, there has arisen a class of so-called "oölogists" who imagine that by amassing a large series of birds' eggs they are advancing science. Science does not countenance this sort of collecting and no good comes of it. The continual collecting of eggs has an ultimate effect upon the abundance of a bird and this alone has exterminated the Fish-hawks on Seven Mile Beach where they formerly nested by scores. The leading ornithologists of the country some years ago tried to discourage this practice of excessive egg collecting by issuing a circular, which we cannot do better than reprint. Fortunately the use of the camera in securing a collection of photographs of nests and young is largely supplanting this fad of egg collecting.

Hints to Young Bird Students.

It has always been our experience that young bird students who have just crossed the threshold of ornithology are glad to turn for a word of advice and assistance to their older brethren, who have already made some progress in the science; and it has always been a pleasure for us to give such aid.

In view of these facts we take this opportunity of offering a few words of counsel for the benefit of those who are beginning the study of birds.

Doubtless every beginner looks upon the formation of a collection as necessarily the first step on the ornithological ladder; and probably a collection of eggs is preferred to a collection of birds, because the specimens can be prepared much more readily.

Soon you meet complaints from well meaning persons who object to robbing birds' nests, and you reply that you are collecting for scientific purposes. Very good; science has need of you all, but do you know what scientific ornithology—real ornithology—is?

Are you not influenced to some extent at least by "Oölogical" magazines and dealers' price-lists of eggs, from which you learn that it is

important to secure *series of sets*—which means hundreds and thousands of eggs—and wherein you also learn the market price of this or that egg, and value your specimens accordingly—just as you do your postage stamps. This is not science, and the men who advocate this sort of collecting and who have the largest collections of eggs rarely contribute anything to our knowledge of birds and are not advancing the science of ornithology.

If you must have a collection, a few sets of eggs (often a single set) of each species of bird will answer all your purposes. There is nothing to be gained by the collecting of a series, except the extermination of the birds, which is surely not your object.

On the other hand, there is a vast amount of bird work that you can do to help the science of ornithology and gain a reputation for yourself.

There are hundreds of facts regarding the distribution of birds, their habits, etc., which are still unknown, and you should make it your aim to become an authority on the birds of your region, and keep records of all your observations as to migration, habits, abundance, etc. You will find ample opportunity for work, as every year will bring to light new facts, and the more you contribute to our knowledge of the birds the more you will see what an insignificant matter the formation of an egg collection is in comparison with real ornithology.

In the case of birds, it is justifiable to shoot specimens which are new to you for purposes of identification, but you should make the best use of the bird *before* you kill it, so that it will not be necessary to shoot more of the same kind in order to tell what they are. Your aim should be to learn to recognize birds at sight and by their notes, and you will find you will learn more of value by a study of the living bird than by collecting skins.

The exact knowledge that we now possess of the coloration, etc., of North American birds and the large collections available for study in the museums render it entirely unnecessary for *every bird student* to form a collection. Those who undertake any special line of study will soon learn what specimens are required and collect accordingly, instead of amassing a large number of specimens with no particular object in view.

These suggestions are not made with a fault finding or sentimental feeling, but in a friendly spirit for the purpose of counteracting the effect of the advice of egg dealers and traders, who seem bent upon developing our budding students into "eggers" instead of ornithologists.

We have all killed birds and collected eggs, but not to a useless excess, and have always, we believe, made real use of our collections in adding to the knowledge of birds and advancing the science of ornithology.

As active members of the American Ornithologists' Union we are only too glad to encourage the study of birds and aid the beginner, but unless some steps be taken against this useless egg collecting the extermination of some of our birds at least will soon be effected.

We ask your earnest consideration of these points and trust you will aid us by your influence and example in advancing true ornithology and in discouraging the waste of bird-life occasioned by this "fad" of egg collecting.

WITMER STONE,
Conservator Ornithological Section Acad. Nat. Sci., Philadelphia.

J. A. ALLEN,
Curator Dept. Vertebrate Zool. Amer. Mus. Nat. Hist., New York City.

FRANK M. CHAPMAN,
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ROBERT RIDGWAY,
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C. HART MERRIAM,
Chief U. S. Biol. Survey, Dept. of Agriculture, Washington, D. C.

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Ass't Biol. Survey, Dept. of Agriculture, Washington, D. C.

A. K. FISHER,
Ass't Biol. Survey, Dept. of Agriculture, Washington, D. C.

WILLIAM BREWSTER,
Curator Dept. of Birds, Museum Comp. Zool., Cambridge, Mass.

WILLIAM DUTCHER,
President National Asso. of Audubon Societies, New York City.

JOHN H. SAGE,
Secretary American Ornithologists' Union, Portland, Conn.

Movements for Bird Protection.—The State Legislature has from time to time passed laws protecting the insectivorous birds and regulating gunning. Scarcely a session passes but that some measure, frequently a retrograde one, is introduced, and it behooves all who are interested in birds to pay careful attention to the action of the Legislature and use their influence for or against the bills according to their merit.

The Biological Survey of the United States Department of Agriculture has distributed a vast number of publications by experts of its staff on the food habits and value of birds. It also maintains a department of game preservation, under Dr. T. S. Palmer, who keeps track of all state legislation and co-operates with local bodies by furnishing advice and assistance in securing good laws.

Some twenty years ago there began to be organized State Audubon societies for the protection of birds, their activities being chiefly in the discouragement of the wearing of birds in millinery, the encouragement of bird study in the schools, and in advocating protective legislation. Later there was established in New York City the National Association of Audubon Societies, under the presidency of Mr. William Dutcher, which establishes active bird protection, distributes literature and information, etc., in all parts of the country. The remaining gull colonies on the New Jersey coast are under the care of the wardens of this association.

The main hope for adequate bird protection lies in educating the public, especially the children, up to a proper realization of the importance of birds to humanity.

New Jersey may well be proud of her record in the early days of bird and game protection, as in 1850 her Legislature passed the first State law protecting insectivorous birds, while in 1873, in incorporating the West Jersey Game Protective Association, she made the first provision for non-resident licenses. Let us hope that our State may be among the first to awaken to the need of still more exacting laws which the rapid decrease of game demands.

The Value of Birds.—The food habits and value of most of our birds are given under the various species or families in the following pages, but we shall summarize the more important facts here for easy reference, taking our data from the publications of the United States Department of Agriculture.

Hawks and Owls.—With the exception of a few species, such as the Sharp-shinned Hawk, Cooper's Hawk, Goshawk and Great Horned

Owl, these birds feed almost exclusively on mice and grasshoppers and are of great economic importance.

Cuckoos.—Entirely beneficial, especially noteworthy as destroyers of caterpillars.

Woodpeckers.—Almost entirely beneficial, food consisting of insects of various kinds, mainly wood-borers, but in the case of the Flicker largely ground insects, including the notorious Chinch Bug. The Red-headed Woodpecker very rarely takes fruit and berries, and the Yellow-bellied Sapsucker sometimes injures trees by girdling them with holes, but such damage is easily overbalanced by the good they do.

Nighthawks, Swifts, Flycatchers, Swallows, Vireos, Warblers, Wrens, Titmice, Nuthatches and *Kinglets* are almost or entirely insectivorous, and never do damage of any kind. The benefit to the farmer that these birds render in the destruction of noxious insects is incalculable.

Native Sparrows and *Finches, Orioles, Thrashers, Thrushes, Bluebirds* and *Meadow Larks,* while not wholly insectivorous, limit their vegetable diet to wild berries and fruits and seeds of weeds and grass, so that they are wholly beneficial.

Crows, Blackbirds, Robins and *Catbirds* are the species usually denounced by farmers, and often with just cause, but we must not forget the fact that the damage these birds do to grain or fruit is limited to a very small part of the year, while during the other months they are beneficial for the most part. Devices for driving them away from crops or planting wild fruit trees for their use, as explained under the several species in the following pages, is far wiser than extermination.

Kingfishers, Herons and *Fish-hawks* are often condemned by owners of fish ponds but the damage they do is very slight, and, as Mr. F. M. Chapman says, "The value of birds to man cannot be expressed in dollars and cents. The Kingfisher is far too interesting and characteristic a feature of our ponds, lakes and waterways to be exterminated. Admitting that certain individuals of the species are injurious, it does not follow that the whole race should be condemned."

The following pamphlets should be consulted by all interested in the preservation of our birds:

Educational Leaflets. Issued by the National Association of Audubon Societies, 141 Broadway, N. Y.

How Birds Affect the Orchard. F. E. L. Beal, U. S. Dept. Agriculture Year-book, 1900.

Hawks and Owls as Related to the Farmer. U. S. Dept. of Agriculture Year-book, 1894.

The Common Crow of the U. S. Bull. No. 6, U. S. Dept. Agr., Div. Orinth. and Mam., 1895.

Also numerous other pamphlets issued by the Department of Agriculture on food of various common birds.

Bird Day in the Schools.—The cultivation of an interest in bird protection in our schools cannot be too strongly encouraged. Therein probably lies our hope of success in our efforts at bird protection in the future.

Some States have regularly established bird days, some suggest the combination of bird-day and arbor-day exercises. Whether any special day has been set aside or not teachers can easily provide for some observance of the kind during spring, when the attention of the scholars can be concentrated upon birds and their value. Essays on common birds may be read, drawings of birds copied, songs about birds sung, and possibly an illustrated lecture may be delivered before the school.

The Audubon societies have literature to distribute and sometimes have traveling libraries, lantern slides or specimens that may be obtained. Detailed suggestions may be had from Miss Julia S. Scribner, Secretary New Jersey Audubon Society, 510 E. Front street, Plainfield, or Mr. William Dutcher, President National Association of Audubon Societies, 141 Broadway, New York City.

Teachers will find F. M. Chapman's "Bird Life," teachers' edition, a helpful book, while "Bird Lore," a bi-monthly magazine, the official organ of the Audubon societies, is indispensable.[1] Those more seriously interested in the ornithology of the State should obtain "Cassinia," an annual devoted to the Ornithology of Pennsylvania, New Jersey and Delaware, which gives a yearly summary of the results of bird study in these States.[2] As further aids to local bird study may be mentioned the collection of the State Museum at Trenton, so admirably arranged by Prof. S. R. Morse, and the local collection at the Academy of Natural Sciences, Philadelphia, both of which are open to the public.

Specimens of birds sent to Mr. Witmer Stone, care of the Academy of Natural Sciences, Logan Square, Philadelphia, will be identified and queries answered so far as possible.

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[1] MacMillan Co., Harrisburg, Penna. One dollar per year.

[2] Published by the Delaware Valley Ornithological Club, care Academy of Natural Sciences, Logan Square, Phila. Fifty cents per copy.

Distribution and Migration.

All birds are at home during the breeding season, which usually covers the latter part of spring and early summer. At other times of year they wander more or less from this breeding area. In some species this wandering or migration is irregular, varying in extent in different seasons according to the scarcity or abundance of the food-supply. In others it has become a definite movement southward in autumn and northward in spring, the apparent result of an hereditary tendency, which may have been acquired at the time when our present seasonal climatic changes originated. Some of these migrations extend over thousands of miles, so that certain of our summer birds of the Northern United States pass the winter in the tropics of South America, while some of the Plover and Sandpipers which breed within the Arctic circle winter in the Argentine Republic or Chili.

The movements of the migrating birds are often very regular from year to year, so that it is possible to predict within a few days when a given species of bird will arrive—at least, when the bulk or normal flight will arrive. There are, of course, occasional stragglers which come exceptionally early.

The way in which birds perform their extended migrations is a matter of great interest, and one concerning which we have still much to learn. We know that there are two classes of migrants, (1) those that fly by day, and (2) those that fly by night. The former comprise most of the birds which habitually associate in compact flocks, such as Doves, Horned Larks, Crows, Jays, Grackles, Blackbirds, Cedarbirds, Titlarks, Robins and Bluebirds; also, Hawks, Swallows, Swifts, Night Hawks and Hummingbirds. The night migrants comprise all our more delicate woodland birds, Thrushes, Warblers, Vireos, Tanagers, Wrens, etc., as well as Rail, Woodcock, Bittern and some Snipe.

It is probable that all birds have a remarkably developed sense of direction, such as we see in the Carrier Pigeon, which enables them to retrace a route over which they have once passed. Then, too, the prominent features of the landscape may serve as a guide to the

migrants in shaping their course, for it is well known that mountains and river valleys stand out distinctly on moonlit nights, and it is on clear nights only that birds migrate.

Night migrants flock together during the flight, forming an immense scattering host of various species, which keep within hearing of one another, if not within sight.

It is possible to hear the chirping of the passing birds on a quiet night, and they may be seen by the aid of a telescope directed toward the full moon.

Professor Cooke has recently shown that many birds have as definite winter homes as they have summer ranges, and furthermore, that species which are closely associated during the breeding season may betake themselves to very different regions in winter. For example, the Black-throated Blue Warbler winters in some of the West Indies, passing southeastward through Florida and the Bahamas, while the Black-throated Green Warbler, which has nearly the same breeding range, travels southwestward to Central America for the winter, being practically an unknown species in Florida and the West Indies.

From the standpoint of any single locality, we may divide our birds into several classes, according to their habits of migration, viz.:

(1) *Residents.*—Birds that are with us throughout the year.

(2) *Summer Residents.*—Birds that nest with us, arriving from the South in the spring and returning in the autumn.

(3) *Winter Visitants.*—Birds which nest to the north of us, but come to our neighborhood to pass the winter, returning in the spring.

(4) *Transients.*—Birds which nest to the north of us and winter to the south, passing through our territory in the spring and fall.

(5) *Accidental or Irregular Stragglers,* which do not normally occur in our district.

It is obvious that some birds may belong to two classes, as, for instance, such species as breed with us, but winter just a little farther to the south. Some individuals of these may occasionally remain with us for the winter, and thus become *Residents,* while the bulk of the species are *Summer Residents.* The Robin is a good example.

It is also obvious that in a State with such a long extent north and south as New Jersey possesses, some birds may breed in the northern counties, but not in the south, and *vice versa.*

The birds of New Jersey may be grouped as follows:

RESIDENTS.

Bob White.
Ruffed Grouse.
Turkey Vulture.‡
Marsh Hawk.
Sharp-shinned Hawk.
Cooper's Hawk.
Red-tailed Hawk.
Red-shouldered Hawk.
Broad-winged Hawk.
Duck Hawk.†
Bald Eagle.
Sparrow Hawk.
Barn Owl.‡
Long-eared Owl.
Short-eared Owl.
Barred Owl.
Screech Owl.
Great Horned Owl.
Hairy Woodpecker.
Downy Woodpecker.
Flicker.
Blue Jay.
Crow.
Fish Crow.
Raven.
Starling.
Meadow Lark.
House Sparrow.
Purple Finch.†
Goldfinch.
Song Sparrow.
Swamp Sparrow.
Cardinal.
Cedar Waxwing.
Carolina Wren.
White-breasted Nuthatch.
Tufted Titmouse.
Black-capped Chickadee.†
Carolina Chickadee.‡
Robin.
Bluebird.

SUMMER RESIDENTS.

Pied-billed Grebe.†
Laughing Gull.‡
Common Tern.‡
Black Duck.
Wood Duck.
Bittern.
Least Bittern.
Great Blue Heron.‡
Green Heron.
Black-crowned Night Heron.*
King Rail.*
Clapper Rail.
Virginia Rail.*
Sora.†
Black Rail.
Florida Gallinule.
Coot.†
Woodcock.*
Wilson's Snipe.*†
Upland Plover.
Spotted Sandpiper.
Killdeer.*
Dove.*
Osprey.
Yellow-billed Cuckoo.
Black-billed Cuckoo.
Kingfisher.*
Red-headed Woodpecker.*
Whip-poor-will.
Nighthawk.
Chimney Swift.
Hummingbird.
Kingbird.
Great-crested Flycatcher.
Phoebe.*
Wood Pewee.
Acadian Flycatcher.
Least Flycatcher.†
Alder Flycatcher.†
Bobolink.†
Cowbird.*
Red-winged Blackbird.*

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* Winter occasionally in the southern counties.
† Breed only (or chiefly) in the northern counties.
‡ Breed only in the southern counties.

Orchard Oriole.
Baltimore Oriole.
Purple Grackle.*
Vesper Sparrow.*
Savanna Sparrow*†
Grasshopper Sparrow.
Henslow's Sparrow.
Sharp-tailed Sparrow.*
Seaside Sparrow.
Chipping Sparrow.*
Field Sparrow.*
Towhee.*
Rose-breasted Grosbeak.†
Indigo Bunting.
Dickcissel.
Scarlet Tanager.
Purple Martin.
Cliff Swallow.
Barn Swallow.
Tree Swallow.*
Bank Swallow.
Rough-winged Swallow.
Red-eyed Vireo.
Warbling Vireo.
Yellow-throated Vireo.
Solitary Vireo.†
White-eyed Vireo.
Black and White Warbler.
Worm-eating Warbler.
Blue-winged Warbler.
Golden-winged Warbler.†
Nashville Warbler.†
Parula Warbler.
Yellow Warbler.
Chestnut-sided Warbler.†
Black-throated Green Warbler.†
Pine Warbler.*
Prairie Warbler.‡
Ovenbird.
Louisiana Water Thrush.
Kentucky Warbler.
Maryland Yellow-throat.
Yellow-breasted Chat.
Hooded Warbler.
Redstart.
Catbird.*
Brown Thrasher.*
Mockingbird.*
House Wren.*
Short-billed Marsh Wren.*†
Long-billed Marsh Wren.*
Blue-gray Gnatcatcher.‡
Wood Thrush.
Veery.†

WINTER VISITANTS.

Holboell's Grebe.
Horned Grebe.
Loon.
Red-throated Loon.
Razor-billed Auk.
Brunnich's Murre.
Dovekie.
Kittiwake Gull.
Glaucous Gull.
Black-backed Gull.
Herring Gull.
Ring-billed Gull.
Merganser.
Green-winged Teal.
Golden-eye Duck.
Bufflehead.
Old Squaw.
King Eider.
Scoter.
White-winged Scoter.
Surf Scoter.
Purple Sandpiper.
Rough-legged Hawk.
Saw-whet Owl.
Horned Lark.
Prairie Horned Lark.
Red Crossbill.
Redpoll.
Pine Siskin.
Snow Bunting.
Lapland Longspur.
Ipswich Sparrow.
White-throated Sparrow.
Tree Sparrow.

* Winter occasionally in the southern counties.
† Breed only (or chiefly) in the northern counties.
‡ Breed only in the southern counties.

Junco.
Northern Shrike.
Myrtle Warbler.
Winter Wren.
Brown Creeper.
Red-bellied Nuthatch.
Golden-crowned Kinglet.

TRANSIENT VISITANTS.

Pied-bill Grebe.
Pomarine Jaeger.
Parasitic Jaeger.
Long-tailed Jaeger.
Bonaparte's Gull.
Cory's Shearwater.
Leach's Petrel.
Gannet.
Double-crested Cormorant.
Red-breasted Merganser.†
Hooded Merganser.
Mallard.
Widgeon.
Blue-winged Teal.
Pintail.
Redhead.
Scaup Duck.
Lesser Scaup Duck.
Ruddy Duck.
Snow Goose.
Canada Goose.
Brant.
Red Phalarope.
Northern Phalarope.
Dowitcher.
Long-billed Dowitcher.
Stilt Sandpiper.
Knot.
Pectoral Sandpiper.
White-rumped Sandpiper.
Least Sandpiper.
Red-backed Sandpiper.*
Semipalmated Sandpiper.
Western Sandpiper.
Sanderling.
Greater Yellowlegs.
Lesser Yellowlegs.
Solitary Sandpiper.
Willet.
Hudsonian Curlew.
Black-bellied Plover.
Golden Plover.
Semipalmated Plover.
Turnstone.
Pigeon Hawk.*
Yellow-bellied Woodpecker.*
Olive-sided Flycatcher.
Yellow-bellied Flycatcher.
Rusty Blackbird.*
Bronzed Grackle.
Nelson's Sharp-tailed Sparrow.
Acadian Sharp-tailed Sparrow.
White-crowned Sparrow.
Lincoln's Sparrow.
Fox Sparrow.*
Philadelphia Vireo.
Tennessee Warbler.
Cape May Warbler.
Black-throated Blue Warbler.
Bay-breasted Warbler.
Black-poll Warbler.
Blackburnian Warbler.
Palm Warbler.
Yellow Palm Warbler.*
Water Thrush.
Connecticut Warbler.
Mourning Warbler.
Wilson's Warbler.
Canada Warbler.
Titlark.*
Ruby-crowned Kinglet.
Gray-cheeked Thrush.
Bicknell's Thrush.
Olive-backed Thrush.
Hermit Thrush.*

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* Occasionally remain all winter in the southern counties.

† Ducks vary according to whether the waters of bays and ponds freeze over. Many of them may be winter residents in some seasons.

IRREGULAR OR ACCIDENTAL VISITANTS.

(a) From the south in summer.

Gull-billed Tern.†
Royal Tern.
Caspian Tern.
Roseate Tern.†
Forster's Tern.†
Sooty Tern.
Least Tern.†
Black Skimmer.†
Greater Shearwater.
Audubon's Shearwater.
Sooty Shearwater.
Wilson's Petrel.*
Brown Pelican.
White Ibis.
Glossy Ibis.
American Egret.†
Little Blue Heron.†
Snowy Egret.†
Yellow-crowned Night Heron.
Purple Gallinule.
Wilson's Plover.†
Piping Plover.†
Oystercatcher.†
Black-necked Stilt.†
Ground Dove.
Black Vulture.
Swallow-tailed Kite.
Red-cockaded Woodpecker.
Red-bellied Woodpecker.†
Pileated Woodpecker.†
Blue Grosbeak.†
Summer Tanager.†
Prothonotary Warbler.
Cerulean Warbler.
Yellow-throated Warbler.
Brown-headed Nuthatch.

(b) From the north in winter.

Puffin.
Black Guillemot.
Fulmar.
Cormorant.
Harlequin Duck.
Eider Duck.
Goshawk.
Hawk Owl.
Snowy Owl.
Evening Grosbeak.
Pine Grosbeak.
White-winged Crossbill.
Greater Redpoll.
Bohemian Waxwing.

(c) Transients of irregular occurrence.

Black Tern.
Gadwall.
Shoveler.
Canvasback.
Ring-necked Duck.
Blue Goose.
White-fronted Goose.
Black Brant.
Whistling Swan.
Wilson's Phalarope.
American Avocet.‡
Marbled Godwit.
Hudsonian Godwit.
Buff-breasted Sandpiper.
Baird's Sandpiper.
Long-billed Curlew.‡
Golden Eagle.
Migrant Shrike.
Orange-crowned Warbler.
Grinnell's Water Thrush.

* Petrels and Shearwaters are regular summer visitors but do not nest here.
† Formerly bred in southern New Jersey.
‡ Formerly nested in New Jersey, although in the case of the Curlew the record may be open to question.

(d) Accidental stragglers.

From Europe.

European Widgeon.
European Green-winged Teal.
Corn Crake.
European Woodcock.
Curlew Sandpiper.
Ruff.

From the West.

White Pelican.
Arkansas Kingbird.
Scissor-tailed Flycatcher.
Lark Sparrow.
Varied Thrush.

(e) Species apparently extinct in the State.

Eskimo Curlew.
Whooping Crane.*
Passenger Pigeon.*
Pinnated Grouse.*
Wild Turkey.*

Birds are limited in their distribution during the breeding season by the various isotherms which divide the country into several distinct life zones. These do not run like the parallels of latitude, but are bent and irregular according to the elevation of the country. A mountain chain brings a cool climate with boreal birds and plants far southward, while a low open river valley carries southern species and a mild climate northward.

In New Jersey the southern half of the State from Trenton to the Raritan and lower Hudson valley belongs to the Carolinian Zone—a belt characterized by the presence of such birds as the Cardinal, Kentucky Warbler, Worm-eating Warbler, Blue-winged Warbler, Tufted Titmouse, Carolina Chickadee, Carolina Wren and Acadian Flycatcher.

North of this we have the Alleghanian Zone in which we find as breeding birds the Veery, Least Flycatcher, Redstart, Chestnut-sided Warbler, Rose-breasted Grosbeak and Bobolink. The boundary is not sharply drawn and some of the Carolinian species here and there press a little farther north and the Alleghanian species a little southward. In the immediate vicinity of the Delaware river indeed some Carolinian species extend as far as the northern boundary of New Jersey.

The Canadian Zone which covers much of the northern United States extending southward to the summits of the Adirondacks, Catskills and the Alleghanies to North Carolina, is probably not

* Formerly nested in New Jersey, although in the case of the Crane the record may be open to question.

represented in New Jersey bird life or at least very slightly. The presence of the Brown Creeper and Solitary Vireo as breeding birds in Sussex county is the only evidence, but our knowledge of the birds of northwestern New Jersey is so very meagre that there may be other Canadian species breeding there—such would be the Junco, Hermit Thrush, various Warblers, Golden-crowned Kinglet and Winter Wren.[1]

The species mentioned in these groups are only the more characteristic ones. The detailed distribution of all will be found in the systematic portion of the report.

Other conditions affect the distribution of birds besides temperature.

Many species are strictly pelagic—never seen away from the ocean unless driven in by storms; others are birds of the sea beach; others—notably the Seaside and Sharp-tailed Sparrows and the Clapper Rail—are birds of the salt meadows.

The great pine-barren wilderness, with its peculiar conditions of soil and its strikingly different vegetation, furnishes favorable conditions for certain species which are rare elsewhere, as the Pine, Prairie, Hooded and Parula Warblers, while many other species—and southern ones, too—are entirely absent, notably the Worm-eating, Kentucky and Blue-winged Warblers.

The dates of arrival and departure are given under each species, but from the fact that some species are partly resident and the migratory movement is somewhat straggling, it is difficult to select one date that may be said to represent the "date of arrival." The first individual may be a straggler which wintered far north of the bulk of his kind, and to take his date of arrival would be misleading. Where we have a large number of observers as about Philadelphia, I have adopted the plan of selecting the date when a species had arrived at a majority of the observation stations.[2] This eliminates early stragglers, and might be said to be the date of the first bulk movement.

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[1] A trip taken June 4th–11th, 1909, by Messrs. S. N. Rhoads, Wm. L. Baily and Dr. Wm. E. Hughes to northern Passaic and Sussex counties showed none of these species present. The Canada, Black-throated Green and Black-throated Blue Warblers were the only birds of Canadian tendencies noted even in most favorable spots, while several Carolinian species occurred, notably in the Wallkill Valley, but also at Greenwood Lake. It therefore seems that the Canadian element in the New Jersey bird fauna must be regarded as slight and sporadic.

[2] See for details Cassinia, 1904–1908, and especially Proc. Acad. Nat. Sci., Phila., 1908, pp. 128–156.

An average of the dates thus obtained during the past six years gives us the following spring migration schedule of the commoner species for the vicinity of Philadelphia, and it is not probable that New Jersey dates vary from these more than a day or two, even in the extreme northern and southern sections of the State.

March 2. Bluebird.
3. Purple Grackle.
4. Robin.
8. Fox Sparrow.
Meadow Lark.
10. Red-winged Blackbird.
13. Flicker.
14. Killdeer.
19. Field Sparrow.
21. Phoebe.
25. Cowbird.
29. Chipping Sparrow.
30. Vesper Sparrow.

April 10. Yellow-bellied Sapsucker.
12. Ruby-crowned Kinglet.
13. Hermit Thrush.
17. Yellow Palm Warbler.
19. Towhee.
Bank Swallow.
Rough-winged Swallow.
22. Tree Swallow.
Chimney Swift.
23. Barn Swallow.
24. Myrtle Warbler.
Brown Thrasher.
25. Spotted Sandpiper.
26. Black and White Warbler.
27. House Wren.
28. Grasshopper Sparrow.
Maryland Yellow-throat.
29. Solitary Vireo.
Catbird.
30. Yellow Warbler.
Ovenbird.
Wood Thrush.

May 2. Veery.
3. Yellow-throated Vireo.
White-eyed Vireo.
Water Thrush.
Redstart.
Black-throated Green Warbler.
4. Kingbird.
Great-crested Flycatcher.
Parula Warbler.
Black-throated Blue Warbler.
5. Baltimore Oriole.
Orchard Oriole.
Yellow-breasted Chat.
6. Rose-breasted Grosbeak.
Scarlet Tanager.
Red-eyed Vireo.
Warbling Vireo.
Blue-winged Warbler.
Chestnut-sided Warbler.
Kentucky Warbler.
7. Indigo Bunting.
Magnolia Warbler.
Olive-backed Thrush.
8. Bobolink.
9. Yellow-billed Cuckoo.
Hummingbird.
Wood Pewee.
Worm-eating Warbler.
10. Blackburnian Warbler.
11. Black-billed Cuckoo.
Nighthawk.
Black-poll Warbler.
12. Canada Warbler.
Gray-cheeked Thrush.

The Birds of New Jersey.

Birds constitute a distinct class of vertebrate or back-boned animals, but are more closely related to the reptiles than they are to the mammals.

They are distinguished from all other animals by their covering of feathers. Birds, furthermore, are especially adapted for flight, the forelimbs being modified into wings, which are composed mainly of the long, stiff "quill feathers" known as *remiges,* those attached to the "hand" portion of the wing being the *primaries* and those attached to the forearm being the *secondaries,* while the several innermost ones, often differently colored from the others, are the *tertials.*

The bird's foot is also curiously modified. The heel is elevated, and is usually held up near the body, while the long section between it and the toes, which is covered with horny plates or scales (rarely feathers), is known as the *tarsus,* and corresponds to the "instep" of a man's foot. The feet are webbed, elongated, etc., according to the various methods of progression. The bird's jaws are encased in horny sheaths forming the bill, which exhibits great diversity of shape and structure according to the varying food habits of the different species.

Birds are hatched from eggs which are laid in nests especially prepared for their reception, and are incubated by the parents, the female performing the greater part of this labor.

Existing birds comprise two main groups—the Ostriches and their allies on the one hand, and all other birds on the other.

The latter are variously subdivided, the groups represented in New Jersey being distinguished in the following key, which is to be used as the first step in identifying an unknown bird, the page references taking one on to the various family keys contained in the main text.

KEY FOR THE IDENTIFICATION OF NEW JERSEY BIRDS.

All terms are explained in the Glossary at the end of the volume. All measurements are given in *inches and hundredths* expressed in decimal form. In the descriptions of species only such plumages are given as are worn during the period of the year at which the bird occurs in New Jersey. Nests and eggs are only described when the bird breeds or formerly bred in the State.

a. Hind toe connected with the inner toe by a web. STEGANOPODES, p. 70

aa. Hind toe not connected by a web (sometimes entirely absent).

b. Nostrils tubular. TUBINARES, Petrels, p. 66

bb. Nostrils not tubular.

c. Edges of the bill with a series of teeth or lamellæ. ANSERES, Ducks, etc., p. 74

cc. Edges of bill not fringed with lamellæ.

d. Forward toes conspicuously flat and lobed on the side; claws also flat. COLYMBIDÆ, Grebes, p. 38

dd. Toes and Claws not flat.

e. Three forward toes webbed to the tips.

f. No hind toe. ALCIDÆ, Auks, etc, p. 43

ff. Hind toe present.

g. Bill with upper mandible rounded or curved at tip. LARINÆ, Gulls, and STERCORARIIDÆ, Skuas, pp. 49 and 47

gg. Bill sharp pointed.

h. Tarsus conspicuously compressed. GAVIIDÆ, Loons, p. 41

hh. Tarsus not flat. STERNINÆ, Terns, p. 50

ggg. Bill compressed, knife like; upper mandible shorter than lower. RYNCHOPIDÆ, Skimmer, p. 65

ee. Forward toes not fully webbed.

f. Lower part of thigh naked.

g. Hind toe well developed and on a level with the others.

h. Lores or eye region naked. ARDEIDÆ, Herons, etc., p. 98

hh. Lores and eye region feathered. RALLIDÆ, Rails, etc, p. 109

gg. Hind toe small and elevated above the others.

h. Lores and eye region naked. GRUS, Cranes, p. 108

hh. Lores and eye region feathered.

i. Middle toe and claw nearly equal to tarsus. RALLIDÆ, Rails, etc., p. 109

ii. Middle toe and claw distinctly shorter than tarsus.

j. Tarsus over 3.50. RECURVIROSTRIDÆ, Stilts and Avocets, p. 120

jj. Tarsus under 3.50.

k. Sides of toes with lobes. PHALAROPIDÆ, Phalaropes, p. 117

kk. Sides of toes without lobes. SCOLOPACIDÆ, Snipe, p. 122

ggg. No hind toe.

h. Bill under 2. CHARADIIDÆ, Plovers (also ARENARIA, p. 147), p. 142

hh. Bill over 2. HÆMATOPODIDÆ, Oyster-catchers, p. 148

ff. Lower part of thigh fully feathered.

g. Bill strongly hooked. RAPTORES, Hawks, Owls, etc., p. 156

gg. Bill not strongly hooked.

h. Hind toe small and elevated. GALLINÆ, Grouse and Quail, p. 149

hh. Hind toe well developed and on a level with the others.

i. A soft cere at base of bill. COLUMBÆ, Pigeons, p. 153

ii. No cere.

k. Length not over 3.75; bill .60–.70. ARCHILOCHUS, Hummingbird, p. 188

k. Size much larger or bill relatively much shorter.

l. Tail feathers with projecting spines; bill very short; mouth wide. CHÆTURA, Swift, p. 187

ll. Tail feathers without spines.

m. Middle toe nail serrate on side. CAPRIMULGIDÆ, Whip-poor-will, etc., p. 185

mm. Toe nails not serrate.

n. Middle and outer toes joined for over half their length. CERYLÆ, Kingfisher, p. 177

nn. Toes not joined for half their length.

o. Toes arranged two in front and two behind.

p. Tail feathers very stiff and pointed. PICIDÆ, Woodpeckers p. 178

pp. Tail feathers not pointed. COCCYZUS, Cuckoos, p. 176

oo. Toes arranged three in front and one behind. PASSERES, Perching Birds, p. 189

EXPLANATIONS.

The nomenclature is that of the forthcoming third edition of the American Ornithologists' Union Check List. Although the species are not to be numbered in this work, I have added the numbers of the previous edition of the Check List at Mr. Morse's request.

Where two dates of arrival appear, the first is the average date of first arrival, that in parentheses the bulk arrival (see p. 32). Quotations from the works of Wilson and Audubon, Abbott's List (1868), Turnbull's (1869) and Thurber's (1887) are usually not accompanied by page reference, but all other published records are accompanied by footnote references. Full titles of all publications on New Jersey birds will be found in the Bibliography on p. 317.

W. S.

Order PYGOPODES.

Diving Birds.

Family COLYMBIDÆ.

The Grebes.

The Grebes are notable as divers, and owe their popular name of Hell-divers to their propensities in this line. Their feet are set well back, the toes broadly lobed (not connected by a web), and both toes and tarsus are exceedingly flat; the plumage is dense, soft and silky; wings short and rounded; tail absent—merely a few downy feathers like the rest of the plumage. Three species occur in the State:

a. Bill slender, more than twice as long as deep, sharp pointed.
b. Length, 18–20. Holboell's Grebe, p. 38
bb. Length, 12–15. Horned Grebe, p. 39
aa. Bill stout, length less than twice the depth, upper mandible curved at tip. Pied-billed Grebe, p. 40

2 Colymbus holboelli (Reinhart).

Holboell's Grebe.

Adults in spring.—Length, 18–20. Wing, 7.30–8.10. Above, black; below, silky white; top of head, dull black; rest of head and back of neck, ash gray; neck rufous in front and on sides; secondaries, white.
Adults in winter.—Similar, but lacking the gray and rufous.

Rare winter visitant along the coast and bay shore, November to March; more frequent in migrations.

The first record that I find of the occurrence of this species in the State is a specimen in the Philadelphia Academy collection, shot at Pemberton, N. J., in 1857, and procured in market by Dr. J. C. Coleman. Beesley, Abbott and Turnbull each give it as rare, without any definite record.

The following more recent captures have come to my notice:
Delaware Bay; winter of 1877 or 1878. C. A. Voelker.
Atlantic City; found dead February 1st, 1883. Geo. S. Morris.[1]
Delaware River, opposite Chester; October, 1891. Colla. W. Stone.[1]
Lower Delaware River; February, 1894. C. A. Voelker.[1]

[1] Stone, Birds of E. Pa. and N. J., p. 38.

Riverton; February 21st, 1894. John Reese.[1]
Delaware River, opposite Tinicum; April 7th, 1902. L. I. Smith.[2]
Wildwood; April 1st, 1904. Wm. L. Baily.

In addition to the inland record at Pemberton, there was one bird obtained at Marlton, April 4th, 1904, J. D. Carter.[3] Mr. Scott took one at Princeton in 1879,[4] and the species is reported to have occurred rarely in Morris county by Mr. R. C. Casky.

At Englewood, N. J., Mr. Geo. E. Hix,[5] has recorded the occurrence of a single bird on a pond on June 10th, where it was seen twice afterward, disappearing between the 24th and 27th. Mr. H. H. Hann records a few shot on the Passaic river, near Summit.[6]

3 Colymbus auritus Linnæus.

Horned Grebe, Hell-Diver.

PLATE 1.

Adults in spring.—Length, 12.50–15. Wing, 5.75. Above, blackish; below, silky white, lower neck, breast and sides rufous; a dense tuft of ochraceous feathers on each side of the head, throat and sides of upper neck, black; secondary wing feathers, white.

Adults and young in winter.—Similar, but duller, and lacking the rufous breast and ochraceous plumes.

A tolerably common winter resident on the coast and bay, rather plentiful in migrations, which seem to occur in late October and early November, and during March and April. We have numerous records in the vicinity of Philadelphia, April 7th to 29th. The latest New Jersey record that I have seen was May 3d. It occurs also regularly on the Delaware and other streams, and on ponds in the interior.

This and the following are the birds popularly known among gunners as "Hell-divers," and are to be seen swimming about, generally singly, with the body low in the water and the neck erect. They are good swimmers and still better divers, disappearing instantly at the discharge of a gun or other cause of alarm.

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[1] Abst. Proc. D. V. O. C., II., p. 12.
[2] Cassinia, 1902, p. 43.
[3] Cassinia, 1904, p. 54.
[4] Babson, Birds of Princeton, p. 34.
[5] Auk, 1905, p. 407.
[6] Wilson Bull., 1905, p. 119.

6 Tachybaptus podiceps (Linnæus).

Pied-billed Grebe.

PLATE 2.

Adults in spring and summer.—Length, 12–15. Wing, 4.50–5. Above, brownish black; silvery white below; indistinctly spotted with dusky and overlaid with buff tips; throat, black; bill, white, crossed by a black band. *In winter.*—Feathers tipped with buff.

Young in autumn and winter.—Similar, but without the black on the throat and bill, or the dusky spots below; breast, buff.

Downy young.—Head and neck striped black and white, a rufous spot on the crown, another on the nape and one on each side of the head; back, blackish, with four grayish-white stripes.

Nest in shallow water, a heap of decaying leaves; eggs, four to eight, soiled white. 1.70 x 1.18.

Chiefly a migrant, occurring most abundantly from March 15th to April 20th, and in November; said to winter occasionally.

This species is common on the ponds of the interior, and on the creeks and rivers, but seems to be rare on the sea coast. Beesley[1] does not mention it as occurring on the Cape May coast, nor did Scott[2] observe it at Long Beach, while Laurent[3] has met with it but twice on Five Mile Beach.

It was reported to Mr. Rhoads as a regular breeder on Lake Hopatcong,[4] and Thurber[5] gives it as a rather rare summer resident in Morris county, but states that he had never found a nest, nor had any nest been recorded from the State up to 1906.

On May 30th of that year the Grebe was found nesting in the Newark marshes, and during the season five nests were discovered by Messrs. Hann, Callender, H. F. Merriam, W. D. Miller and C. G. Abbott.[6] Eggs were found as early as May 30th and as late as August 5th. On June 6th, 1908, Mr. R. C. Harlow found two nests in the same marshes, one with fresh eggs, the other with downy young.

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[1] Geol. Cape May county, p. 145.
[2] Bull. Nutt. Orn. Club, 1879, p. 228.
[3] O. and O., 1892, p. 43.
[4] Stone, Birds of E. Pa. and N. J., p. 38.
[5] Birds of Morris county. True Dem. Banner, November 10th, 1887.
[6] C. G. Abbott, Auk, 1907, pp. 1–11.

Family GAVIIDÆ.

The Loons.

Diving and swimming birds allied to the Grebes, with flat compressed tarsus, but with toes connected by webs, as in the ducks. Wings relatively small and narrow, making it difficult for the bird to get started in flight; tail present, but short; bill powerful, sharp-pointed. We have but two species.

a. Length, 28–36. — Loon, p. 41
aa. Length, 24–27. — Red-throated Loon, p. 42

7 Gavia immer (Brünnich).

Loon.

PLATE 3.

Adults in spring.—Length, 28–36. Wing, 13–15. Above, black, with purplish gloss, speckled with square white spots; head and neck, black; fore neck, with a nearly complete collar and short jugular band, composed of white streaks; below, silvery white.

Adults and young in winter.—Dull blackish above, unspotted, but edged with gray; throat and fore neck, white, like the rest of the under parts.

Common transient along the coast and less frequent winter resident. On Long Beach, Scott[1] states that they are most abundant during April and early May, and October to November, and at Cape May Mr. Hand tells me that they are always more plentiful in spring, when they occur in flocks during late April and early May. In autumn he finds them more scattered and less concentrated in their migration, so that they seem less abundant. Probably the majority of the flocks stay well off shore during the migrations, as Mr. Chapman[2] states that he observed a flock of fifty from a steamer while passing north off the coast of Delaware, May 9th, 1897. Mr. Hand's latest date for Cape May is May 9th. Mr. Fowler[3] states that they occur frequently on the Delaware, between Philadelphia and Trenton,

[1] Bull. Nutt. Orn. Club, 1879, p. 228.
[2] Abst. Proc. Linn. Soc., N. Y., X., p. 2.
[3] Cassinia, 1903, p. 45.

mostly in November. The report furnished to Mr. Rhoads that they bred on Lake Hopatcong[1] has not been confirmed, though they occur rarely both there and on Budd's Lake in migrations.[2]

Like the Grebes, the Loon is an expert diver, and will swim for long distances under water, or with only his head protruding. With us they are birds of the ocean and large bays, and only now and then a straggler, on his way to or from the northern lakes which form his home, is driven by storms to alight on some small pond or even on the ground. In the latter case he is in a sad predicament, as a Loon on land can only flounder along in a most ungainly fashion, falling forward upon his breast after every effort at progression, and darting his snake-like neck here and there with vicious lunges.

11 Gavia stellata (Pontoppidan).

Red-throated Loon.

Adults in spring.—Length, 24–27. Wing, 10–11.50. Above, brownish-black, more or less speckled with white; head and neck, black above, streaked with white, a patch of rich chestnut on the fore neck ending in a point on the throat; under parts, white.

Adults and young in winter.—Above, dull slate color speckled with white; below, white.

This species occurs in practically the same way as the preceding, being most plentiful in migrations. It is apparently less common on the coast, but Mr. Fowler[3] states that on the upper Delaware it seems rather more plentiful than the larger species. Mr. Scott[4] states that he saw and took a number during April, 1877, while at Long Beach. Mr. I. N. DeHaven secured one at Atlantic City, November 5th, 1894,[5] which is the earliest coast record I have found, while one taken by Mr. Stanart on Grassy Sound,[6] June 15th, 1904, is the latest, and is, of course, unusual. In the Delaware, opposite League Island, Mr.

[1] Stone, Birds of E. Pa. and N. J., p. 39.
[2] Thurber, Birds of Morris county.
[3] Cassinia, 1903, p. 45.
[4] Bull. Nutt. Orn. Club, 1879, p. 228.
[5] Abst. Proc. D. V. O. C., II., p. 14.
[6] Burns, Wilson Bull., 1906, p. 25.

Ernest Schluter saw a flock of fifteen, October 20th, 1897, one of which he secured.

The mention of *Colymbus arcticus* in Beesley's Catalogue of Birds of Cape May County[1] undoubtedly refers to this species.

Family ALCIDÆ.

THE AUKS AND GUILLEMOTS.

These birds are swimmers allied to the Gulls, and with similar webbed feet, although the small hind toe is entirely absent. They are pelagic, breeding in the far north, and coming southward, more or less casually, to New Jersey in winter.

a. Inner claw much larger and more curved than the others; bill very much compressed, as high as long. PUFFIN, p. 43
aa. Inner claw not larger than the others; bill longer than high.
b. Length, 9 inches or less. DOVEKIE, p. 46
bb. Length, 12 inches or more.
c. Nostrils not covered by feathers; length, 12–13.50 inches. BLACK GUILLEMOT, p. 44
cc. Nostrils covered by velvety feathers; length, 15–18 inches.
d. Tail rounded, feathers not pointed. BRUNNICH'S MURRE, p. 44
dd. Tail pointed, feathers pointed. RAZOR-BILLED AUK, p. 45

13 Fratercula arctica (Linnæus).

Puffin.

Adults.—Length, 11.50–13. Wing, 6. Upper parts and fore neck, black; sides of head, gray or white; lower parts, white; bill, one inch high at base and about the same length, deeply grooved.

Turnbull says, "An extremely rare winter visitant along the coast," while Warren[2] states that a specimen in the possession of Mr. Joseph Krider was killed about 1876 on the Delaware River, near Chester. There is nothing more definite about its occurrence so far south, and there is but one recent record for Long Island.

[1] Geology of Cape May county, 1857, p. 145.
[2] Birds of Pennsylvania, p. 9.

27 Cepphus grylle (Linnæus).

Black Guillemot.

Adults in spring.—Length, 12–13.50. Wing, 6.25–7. Entirely sooty black, except the wing-coverts, which are, for the most part, white (the greater ones with their basal half black); feet, bright red; bill, black.

Adults in winter.—Body plumage, white, except the back, which is black, broadly veiled with white; wings and tail as in summer.

Young in first winter.—Similar, but plumage above with much more black; wing-coverts and sides tipped with black.

Very rare winter straggler from the north. Krider[1] records the capture of two specimens at Egg Harbor, and Cassin[2] includes New Jersey within the winter range of the species, while Turnbull says, "Occasionally migrates as far south as Cape May in winter." These remarks are doubtless all based upon the same specimens.

The only other record that we have is a single bird shot from a flock of Bufflehead Ducks on the Delaware, near Chester, December, 1898, and presented to the Delaware Valley Ornithological Club by Mr. Chas. A. Voelker.[3]

31 Uria lomvia (Linnæus).

Brunnich's Murre.

Adults in spring.—Length, 15–18. Wing, 7.50–8.50. Upper parts uniform, sooty black; secondary wing feathers tipped with white; neck in front rather browner than the back; rest of lower parts, white.

Adults in winter.—Throat, fore neck and sides of head, white.

Young in first winter.—Similar, but sides of head dusky, and breast slightly mottled with dusky.

Apparently a few occur every year off the coast in winter, and in some seasons they are rather plentiful.

The earliest record that I can find is a specimen probably shot in New Jersey, procured in market at Philadelphia in 1840, and preserved in the Academy of Natural Sciences. Other coast records are:

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[1] Field Notes, p. 84.

[2] Baird, Cassin & Lawrence, Birds of N. A., p. 912.

[3] Abst. Proc. D. V. O. C., III., p. 10.

Abundant off Sandy Hook, December, 1863 (C. C. Abbott); several shot at Perth Amboy, January, 1890;[1] one shot on Great Bay, seven miles from Absecon, early in 1884 (W. J. Sherratt[2]), and another Atlantic City, January, 1899 (Dr. J. F. Prendergast[3]). I have also heard of a number of other captures which must have related to this species.

On the Delaware River it was reported by Mr. C. A. Voelker, in 1894,[4] to be of occasional occurrence, while on December 15th and 16th, 1897, several flocks of fifteen to twenty birds were seen near Beverly, N. J., by Mr. J. Harris Reed,[5] and several secured, while January 11th, 1901, another was killed opposite Byberry.

In the interior Mr. Babson[6] records one taken at Princeton November 25th, 1899, by C. F. Silvester, and another at Cranbury, in the same vicinity, December 16th, 1897. He also tells me of another on the reservoir at Orange, December 24th, 1899.

It was formerly supposed that *U. troile* also occurred off our coast, and Mr. H. Bryant[7] states, with some surprise, that Cassin considered the present species to be the only one found off the New Jersey coast. Subsequent experience seems to have confirmed his view.

32 Alca torda Linnæus.

Razor-billed Auk.

Adults in spring.—Length, 15–18. Wing, 8–8.50. Plumage like that of *Uria lomvia*, but with a white line from the eye to the bill; bill, black, crossed by a white bar.

Adults in winter.—Like winter plumage of *Uria lomvia*, but more white on the sides of the head.

Young in first winter.—Similar, but bill smaller without the grooves, and white bar.

Irregular winter visitant. Some are probably to be found off the coast every winter. Young birds so closely resemble the preceding species that they are constantly confused.

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[1] J. K. L., Forest and Stream, January 15th, 1890, p. 511.
[2] O. and O., 1884, p. 48.
[3] Abst. Proc. D. V. O. C., III., p. 10.
[4] Stone, Birds of E. Pa. and N. J., p. 40.
[5] Auk, 1897, p. 202.
[6] Birds of Princeton, p. 34.
[7] Proc. Bost. Soc., N. H., VIII., p. 142.

A specimen in the Academy of Natural Sciences, obtained in the Philadelphia market in 1856, was probably taken in New Jersey, and is the earliest record with which I am acquainted. Cassin, in 1858,[1] perhaps on the strength of this capture, includes New Jersey in its winter range. There is only one record for the Delaware, a specimen shot at Pennsgrove, November, 1891.[2]

The other records that I have found are as follows:

Long Beach; February 7th, 1878; one shot. W. E. D. Scott.[3]

Cape May county (probably Five Mile Beach); January 20th, 1880. Dr. W. L. Abbott.[4]

Grassy Sound; February, 1891; three seen several times. P. Laurent.[5]

Ocean City; January 10th, 1901; one shot. Mr. Schermerhorn.[6]

Sea Isle City; January 23d, 1909; several seen; one shot by Thos. Mitchell; obtained by W. J. Fox.[7]

34 Alle alle (Linnæus).

Dovekie, Little Auk.

Adults in spring.—Length, 7.25–9. Wing, 4.50. Above, black; head, neck and chest, sooty brown; rest of under parts and tips of secondaries, white; scapulars streaked with white.

Adults in winter.—Similar, but throat and sides of neck white.

Young in first winter.—Similar, but duller, with smaller bill.

An irregular winter visitant along the coast, and occasionally up the bay. Breeds on the rocky Arctic coasts. The earliest New Jersey record is the one referred to by Ord in the ninth volume of the American Ornithology, which "was killed at Great Egg Harbor in the month of December, 1811, and was sent to Wilson as a great curiosity."

Turnbull says it is shot occasionally at Egg Harbor and on the coast, and Krider (Field Notes) took two on the inlet at Atlantic City November, 1874, but there is no other definite record until 1879,

[1] Birds of North America, p. 901.
[2] Abst. Proc. D. V. O. C., I., p. 12.
[3] Bull. Nutt. Orn. Club, 1879, p. 228.
[4] Colln. Acad. Nat. Sci., Phila.
[5] O. and O., 1892, p. 43.
[6] Cassinia, 1901, p. 46.
[7] Colln. Acad. Nat. Sci., Phila.

when Scott states that he had procured many specimens during the past four winters at Long Beach.[1] The winter of 1878-9 seems to have been a great season for these birds. Mr. C. A. Voelker took one at the mouth of the Schuylkill and four others in the Delaware, opposite Tinicum. Dr. W. L. Abbott shot one in Cape May county December 17th,[2] another was taken at Atlantic City about the end of November,[3] and another was found in the woods near Camden in an exhausted condition early in December.[4]

Since then there are but few records. One was shot at Pennsgrove, on the Delaware, in November, 1891;[5] another at Cape May, November, 1904 (H. W. Hand),[6] while one was seen with other sea birds ten to twenty miles off Long Branch December 31st, 1904.[7] A single bird was taken near West Creek, Ocean county, January 19th, 1909, by Joshua Parker.[2]

Order LONGIPENNES.

Long-winged Swimmers.

Family STERCORARIIDÆ.

THE JAEGERS.

The Jaegers differ from the Gulls mainly in their hooked upper mandible and in the presence of a sheath, which covers it at the base, overhanging the nostrils. These birds are parasitic in their habits, pursuing the smaller Gulls and compelling them to disgorge for their benefit the fish that they have swallowed. They are pelagic, and occur on the fishing banks off shore, breeding in the far north.

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[1] Bull. Nutt. Orn. Club, 1879, p. 228.
[2] Colln. Acad. Nat. Sci., Philadelphia.
[3] Collins Bull. Nutt. Orn. Club, 1879, p. 236.
[4] Trotter Bull. Nutt. Orn. Club, 1879, p. 236.
[5] Voelker Abst. Proc. D. V. O. C., I., p. 12.
[6] Cassinia, 1905, p. 59.
[7] Stackpole & Wiegman, Bird Lore, 1905, pp. 27, 28.

a. Length of bill, 1.45–1.75. POMARINE JAEGER, p. 48
aa. Length of bill, 1.10–1.30.
b. Length of nasal shield greater than distance from its end to the tip of the upper mandible. PARASITIC JAEGER, p. 48
bb. Length of nasal shield less than distance from its end to the tip of the upper mandible. LONG-TAILED JAEGER, p. 49

36 Stercorarius pomarinus (Temminck).

Pomarine Jaeger.

Adults.—Length, 20–23. Wing, 13.50–14. Above, dark slaty; wing feathers and tail, black; head, black; collar round the hind neck and whole side of neck white, tinged with buff or yellow; under parts, white, except abdomen and under tail-coverts, which are slaty gray; sometimes the whole breast is mottled with dusky, and the under tail-coverts with white. There is also a dusky phase in which the whole plumage is sooty gray.

Young in first autumn are dark gray banded with buff.

Apparently occurs well off shore, with more or less regularity, in spring and fall, very rarely coming in to the coast.

Mr. Scott secured two on the bay at Long Beach, December, 1876,[1] and another was shot on the Delaware, at Andalusia, October, 1898, by Mr. Chas. Vansciver.[2]

Mr. W. L. Baily describes three birds seen at Ocean City, November 9th, 1895, which were probably of this species.

37 Stercorarius parasiticus (Linnæus).

Parasitic Jaeger.

Adults.—Length, 16–21. Wing, 12–13.50. Similar in all plumages to the Pomarine Jaeger, but smaller and rather lighter colored; breast, dull gray, never mottled.

Regular migrant off shore with the preceding. Mentioned by Turnbull as of rare occurrence, but there is no definite New Jersey record until March, 1892, when Mr. J. F. Brown[3] examined one killed by

[1] Bull. Nutt. Orn. Club, 1879, p. 227.
[2] Abst. Proc. D. V. O. C., III., p. 8. Colln. Acad. Nat. Sci., Phila.
[3] Abst. Proc. D. V. O. C., II., p. 3.

fishermen at Atlantic City. Subsequently Mr. C. A. Voelker[1] reported one seen at Stone Harbor May 27th, 1901.

Audubon, under date of "May, 1829, at Great Egg Harbour," mentions a Lestris [*i. e.*, Jaeger] pursuing the Black-backed Gull, but it is not clear whether the incident occurred there or not, but from the date it seems impossible.

38 Stercorarius longicaudus Vieillot.

Long-tailed Jaeger.

Adults.—Length, 20–23. Wing, 11.50–12.75. Similar to the light phase of the preceding, but with central tail feathers much more elongated (10–14) and proportions of bill different. (See key.)

Apparently occurs with the other species off shore. Not yet reported on the coast.

The only record of this species consists of two individuals seen by Mr. Chapman from a vessel, 80 miles off Barnegat,[2] May 6th, 1894.

Family LARIDÆ.

The Gulls and Terns.

Sea birds with webbed feet and strong wings. The differences between the Gulls and Terns are not very pronounced, but in the New Jersey species the Gulls have the upper mandible curved or rounded at the tip, while in the Terns the bill is sharp pointed. Our Gulls, moreover, have a square tail, while the Terns have it more or less forked. Gulls average larger in size than the Terns, but the Caspian Tern exceeds many of the smaller Gulls.

[1] Cassinia, 1901, p. 50.

[2] Abst. Proc. Linn. Soc., N. Y., No. VII., p. 3.

a. Upper mandible curved at tip, tail square. (GULLS)
b. Size, large; wing, 16.50–19.50.
c. Head and under parts white.
d. Primaries without dark subterminal areas; mantle very pale. GLAUCOUS GULL, p. 51
dd. Primaries with dark subterminal spots and white tips.
e. Mantle dark slaty, almost black. BLACK-BACKED GULL, p. 52
ee. Mantle pearl gray. HERRING GULL, p. 53
cc. Head and under parts dusky. YOUNG HERRING AND BLACK-BACKED GULLS, pp. 52–53
bb. Size, medium; wing, 13.50–15.50.
c. Hind toe absent, or only a rudiment. KITTIWAKE, p. 51
cc. Hind toe present.
d. Bill with a transverse black band. RING-BILLED GULL, p. 54
dd. Bill entirely red. LAUGHING GULL, p. 55
ddd. Bill dusky.
e. Back uniform slate. LAUGHING GULL, p. 55
ee. Back brown or mottled.
f. Base of tail feathers white. YOUNG RING-BILLED GULL, p. 54
ff. Base of tail feathers gray. YOUNG LAUGHING GULL, p. 55
bbb. Size, small; wing, 10.25. BONAPARTE'S GULL, p. 56
aa. Upper mandible sharp pointed like the lower; tail forked. (TERNS)
b. Wing, 12.50–17.50.
c. Tail less than half as long as the wing. CASPIAN TERN, p. 57
cc. Tail more than half as long as the wing.
d. Bill red or orange. ROYAL TERN, p. 57
dd. Bill black, tipped with yellow. CABOT'S TERN, p. 58
bb. Wing, 9.25–12.
c. Upper parts black, lower parts white. SOOTY TERN, p. 63
cc. Upper parts pearl, sometimes mottled with dusky, crown often glossy black.
d. Both webs of outer tail feathers white.
e. Under parts white.
f. Outer web of outermost primary black. ROSEATE TERN, p. 60
ff. Outer web of outermost primary silvery gray. GULL-BILLED TERN, p. 56
ee. Under parts pearl, head white. TRUDEAU'S TERN, p. 58
dd. Only one web of outer tail feathers white.
e. Outer web white. FORSTER'S TERN, p. 59
ee. Inner web white.
f. Dark band on inner web of outer primary deep black and .20 in. wide. COMMON TERN, p. 61
ff. Dark band on inner web of outer primary duller and only .12 in. wide. ARCTIC TERN, p. 59
bbb. Wing, 6–8.25.
c. Tail white. LEAST TERN, p. 62
cc. Tail slaty gray. BLACK TERN, p. 64

40 Rissa tridactyla (Linnæus).

Kittiwake.

Adults.—Length, 16–17.50. Wing, 12.25. Back and wings, pearl gray; head, neck, under parts and tail, white; outer web of outer primary and terminal part of first five primaries, black; third to fifth sometimes with white tips. Head in winter washed with gray, and a dusky spot around the eye.

This gull probably occurs regularly well off shore in winter, especially about the fishing banks. Turnbull says it is "rather rare along the coast," and Mr. S. N. Rhoads told me in 1890 that it had been seen off the coast at Atlantic City. Mr. W. H. Werner informed me that in midwinter, 1894-5, he obtained a number of specimens from fishermen who went out to the banks. Subsequently, he tells me, they have been seen every fall in varying numbers, most numerous in 1898. Mr. Rehn reported one obtained at the same place January, 1896.[1] Messrs. Stackpole and Wiegman report seventy-four adults and thirty-seven immature observed December 31st, 1904, from ten to twenty-five miles off Long Branch,[2] and Messrs. Stackpole and Rogers fifteen in the same vicinity December 27th, 1908.[3] One specimen, mounted by Mr. C. A. Voelker in November, 1893, was said to have been shot in the interior of New Jersey.[4]

42 Larus hyperboreus Gunnerus.

Glaucous Gull.

Adults.—Length, 26–32. Wing, 17–18.50. Above, pale pearl gray on the back and wings, rest of plumage pure white; head and neck faintly streaked with gray.

Young in different stages are pale brownish-gray with buffy edgings, becoming more or less pearl and white; wing feathers varying from pale gray to white.

A rare winter visitant along the northern part of the coast.

There is no mention of this species in any of the New Jersey lists, but in the collection of the late Dr. S. W. Woodhouse there was a

[1] Cassinia, 1901, p. 46.
[2] Bird Lore, 1905, pp. 27, 28.
[3] Bird Lore, 1909, p. 23.
[4] Stone, Birds of E. Pa. and N. J., p. 42.

specimen taken many years ago labeled New Jersey. Mr. Chapman[1] states that several have been killed on the lower Hudson River, and Mr. J. Richardson[2] reports one at Sing Sing, while Messrs. Stackpole and Wiegman[3] saw two, from ten to twenty-five miles off Long Branch, December 31st, 1904.

47 Larus marinus Linnæus.

Great Black-backed Gull.

Adults.—Length, 28–31. Wing, 18–19.50. Back and wings, blackish slate; rest of plumage, white; wing feathers with white tips.

Young in first winter.—Similar to the young Herring Gull, but darker.

A rather rare, but regular, winter visitant along the coast, apparently more plentiful off New York Harbor than farther south. It is mentioned by Turnbull as not uncommon, and Scott found it quite common in the winter of 1876-7 at Long Beach. I have the following records, although many other specimens have been shot:

Cape May county (probably Five Mile Beach); three seen, one shot; January 29th, 1879. Dr. W. L. Abbott.[4]

Atlantic City; two seen during blizzard, March 13th, 1888. S. N. Rhoads.[5]

Tuckerton; March, 1894; one shot by Mr. Jillson.[4]

Tuckerton; February 1st, 1896; several seen. Mr. Jillson.[6]

Stone Harbor; January 11th, 1901; one shot.[7]

Anglesea; February 5th, 1904.[8]

Krider states that he shot one at Barnegat, and has seen specimens shot on the Delaware,[9] and Mr. C. G. Abbott saw one on Overpeck Creek, Leonia,[10] February 26th, 1905.

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[1] Birds of the Vicinity N. Y. City, p. 135.
[2] Abst. Proc. Linn. Soc. N. Y., 1890, p. 2.
[3] Bird Lore, 1905, pp. 27, 28.
[4] Stone, Birds of E. Pa. and N. J., p. 43.
[5] Auk, 1888, p. 318.
[6] Rhoads Abst. Proc. D. V. O. C., II., p. 20.
[7] Stone, Cassinia, 1901, p. 45.
[8] Cassinia, 1904, p. 54.
[9] Field Notes, p. 79.
[10] Abst. Linn. Soc., N. Y., XVII., p. 7.

51 Larus argentatus Pontoppidan.

Herring Gull.

PLATE 4, FIG. 2.

Adults.—Length, 23–26. Wing, 16.50–17.50. Above, back and wings deep pearl gray; rest of plumage white, except the six outer primaries, which are more or less black terminally, all but the outer two tipped with white. Younger birds have the head and neck streaked with dusky.

Young in first winter, sooty gray; throat and under tail-coverts streaked with white; back edged with buff; wing feathers and tail, blackish.

Abundant winter visitant along the coast and up the rivers; arrives September 25th, departs April 15th. Some remain at Philadelphia until April 30th, and at Cape May until May 15th.

The Herring Gull is our most abundant Gull all winter long. It may be seen on the Delaware as far north as Philadelphia, and less abundantly farther up, and also on the Hudson and Passaic, flying about over the water searching for any scraps of food that may be floating past. Old and young in various stages of white and dusky plumage are mingled together. On the coast, where clams are washed up along the beach, the Gulls gather by thousands to feed upon them. Seizing a clam in its bill, one of the birds will ascend about twenty feet, and then let it drop on the hard beach, where it breaks, so that the contents are exposed. As it breaks there is often a rush of more lazy individuals, who not infrequently make off with the prize, amid a general chorus of harsh guttural cries. Frequently we see the Gulls sitting in numbers on the ocean, floating peacefully just beyond the breakers, or at dusk they may be seen gathering to roost back on the sandy patches of the salt meadows, their white breasts conspicuous in the rays of the setting sun.

During migration or after storms they may sometimes be seen inland, flying high over head. One was taken at Whippany, Morris county (Thurber), May 2d, 1886, and one was seen at Budd's Lake, September, 1903 (Caskey). Mr. Babson[1] records one taken at Princeton, March 17th, 1900.

These beautiful birds deserve every measure of protection. They are desirable scavengers in our harbors, and do no harm whatever, while they are of absolutely no use to the thoughtless gunner who kills them. Their use for millinery purposes is happily forbidden by law.

[1] Birds of Princeton, p. 35.

54 Larus delawarensis Ord.

Ring-billed Gull.

Adults.—Length, 18–20. Wing, 14–15.50. Back and wings, pearl gray; outer primary mainly black, this color decreasing in successive feathers to the sixth; two outer ones with subterminal white patches, the others tipped with white; rest of the plumage, white; bill, greenish-yellow crossed by a black band; head streaked with dusky in winter.

Young in first winter sooty, edged above with white; white below more or less mottled with sooty; wings, dull black; tail, white, with a dusky terminal band.

First breeding plumage.—Mantle gray, otherwise like the preceding.

There seems to be considerable difference of opinion on the abundance of this Gull. Turnbull regarded it as abundant; Scott says it is the most plentiful species after the Herring Gull, and Laurent says it is equally abundant at Five Mile Beach.

Krider calls it rare, and Dutcher rather uncommon (on Long Island); Braislin calls it plentiful (on Long Island) in October, but says it does not remain after November 17th. Personally, I have not been on the beach during the migration, and have seen the species in midwinter but once, at Cape May, January, 1892.

The type specimen was obtained on the Delaware, below Philadelphia, about 1815. The only other records of capture that I find are as follows:

Delaware River; November 1st, 1890; W. L. Baily. Stone Harbor; October 3d, 1900; Dr. J. F. Prendergast.[1] Atlantic City; June 20th, 1900; Colln. W. Stone.[1] Two seen at Princeton, November, 1899; W. A. Babson.[2]

Mr. S. N. Rhoads saw several on the Delaware, at Camden, February 17th to 27th, 1895,[3] and Mr. R. F. Miller[4] reports them opposite Bridesburg, Pa., January 22d and March 9th and 30th.

Mr. W. L. Baily saw five on June 30th, 1900, at Stone Harbor, and another at the same place May 21st, 1898. At Wildwood he shot one in immature plumage September 7th, 1895, and saw two March 20th, 1904, and two at Holly Beach December 27th, 1903.

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[1] Abst. Proc. D. V. O. C., IV., p. 5.
[2] Birds of Princeton, p. 35.
[3] Fowler, Cassinia, 1903, p. 46.
[4] Cassinia, 1906, p. 47.

58 Larus atricilla Linnæus.

Laughing Gull, Black-headed Gull.

Adults.—Length, 15–17. Wing, 13. Lower back and wings, plumbeous slate; primaries, black, inner ones tipped with white; head, sooty slate color; rest of plumage, including upper back and neck, white, with more or less of a rosy tint or flush; bill and feet, dark red.

Winter adults.—Head, white, mottled with dusky on nape and ear-coverts, and a gray wash on the breast.

Young in first winter.—Dusky grayish-brown above edged with buff; tail, gray, broadly tipped with black; rump, white; under parts, white, except the breast, which is sooty.

Nest on the salt marshes in grass; made of grass, sea weed, etc.; eggs, three to five, olive brown or olive gray spotted with brown and lilac, 2.25 x 1.60.

The Laughing Gulls select islands in the salt meadows or grassy patches where the water is never very deep, and here, just above high-water mark, their bulky nests of grass, sea weed, etc., are placed. As we approach a colony, the few birds that are always flying about are joined by others that have been sitting on the nests, until, as we land, the whole air is full of flapping wings and the harsh, unearthly laughing cries of the birds as they circle about us, driven to desperation at the danger of their eggs or young.

We have no handsomer bird on our coasts than this beautiful gray and white Gull, with its slaty hood and faint flush of pink on its breast, which seems to leave the feathers soon after the bird has been killed.

Formerly an abundant summer resident on the salt meadows along the coast; it is now restricted to two colonies, one at Brigantine and the other on Gull Island, Hereford Inlet, both under the protection of the National Association of Audubon Societies. The birds arrive April 4th to 20th, and have mostly departed by October 1st. The first sets of eggs are laid in May.

In late summer they are often found in immense flocks on lower Delaware Bay, and in spring and fall occasional individuals come up to Philadelphia or further. Two were taken opposite Bristol October 23d, 1895; one at Fish House, autumn, 1901, and another on Timber Creek, November 7th, 1896.

In the colony at Brigantine, Mr. I. N. DeHaven and I found a few birds (apparently barren) in immature plumage with the breeding

adults, June 7th, 1896, and one was secured. Wilson states that at Great Egg Harbor the Gulls used to frequent the ploughed ground about the farmers' houses when feeding.

60 Larus philadelphia (Ord).

Bonaparte's Gull.

PLATE 4, FIG. 1.

Adults.—Length, 12–14. Wing, 10.25. Back and wings, pearl gray; entire head and throat, plumbeous; hind neck, white; three outer primary feathers mostly white with black tips, the next three with subterminal black areas, and all but the first two with small white tips; rest of plumage, white; bill, black.

In winter—Similar, but head and throat white with a little gray on the back of the head and ear-coverts.

Younger birds have a terminal black band on the tail, and dusky mottlings on the ear-coverts.

Regular spring and fall migrant and winter resident, in some seasons at least.

The original specimen was procured on the Delaware about 1815. Turnbull (1869) regarded the species as "not uncommon," and Krider says, "Found on the Delaware in April and October; not common."

Messrs. Stackpole and Wiegman reported 67, ten miles off Long Branch,[1] December 31st, 1904, and 115 were observed in the same vicinity December 25th, 1908.[2] Apparently, like the Kittiwakes, they keep well off shore, as I find very few records of capture.

Mr. DeHaven secured one at Atlantic City as early as August 21st, 1892,[3] and Dr. W. L. Abbott shot one in Cape May county November 28th, 1879.

63 Gelochelidon nilotica Linnæus.

Gull-billed Tern.

Adults.—Length, 13–15. Wing, 11.75–12.25. Similar in color to the Common Tern, but tail entirely pale gray, almost white, and only slightly forked, and bill and feet black. Irregular summer visitant from the south. Formerly summer resident on the South Jersey coasts.

Nest on beaches or islands in the salt marshes; eggs, three, buffy white with chocolate brown and lilac markings, 1.80 x 1.30.

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[1] Bird Lore, 1905, pp. 27, 28.

[2] Bird Lore, 1909, p. 23.

[3] Stone, Birds of E. Pa. and N. J., p. 44.

A rare straggler from the South, if indeed it still comes this far up the coast. Formerly it bred rather commonly on the marshes of Cape May county, where it was discovered by Wilson about 1813. In 1869 Turnbull regarded it as rare. In 1886 Mr. H. G. Parker[1] reported it still nesting at the lower end of Seven Mile Beach, and Mr. C. S. Shick[2] spoke of it as still present in 1890, associating with the Laughing Gulls. We have no subsequent record for the State.

64 Sterna caspia Pallas.

Caspian Tern.

Adults.—Length, 19–22. Wing, 15–17. Top of head, black, the feathers elongated and hanging over the neck in a sort of crest; back of neck, white; rest of upper parts, pale pearl-gray; primaries, dark slate washed with gray on outer webs; tail and under parts, white; bill large, red, slightly tipped with black.

In winter—Similar, but top of head gray, streaked with black.

A very rare straggler on the coast.

Mr. G. N. Lawrence[3] in 1850 reported a specimen in the collection of Nicholas Pike, of Brooklyn, which was taken in New Jersey. This was probably the basis for Turnbull's statement (1869) that "specimens have been procured from the coast of New Jersey at rare intervals," and so far as I know, there is no further evidence of its occurrence. The records given under the Royal Tern may, however, apply in part to this.

65 Sterna maxima Boddært.

Royal Tern.

Adults.—Length, 18–21. Wing, 14–15. Similar to the Caspian Tern, but rather smaller, and with the inner webs of the primaries largely white.

A very rare straggler on the coast.

Turnbull introduced this species into the New Jersey fauna in 1869 as "very rare." Mr. Scott[4] observed two large Terns at Long Beach,

[1] O. and O., 1886, p. 138.
[2] Auk, 1890, p. 327.
[3] Ann. N. Y. Lyc. Nat. Hist., V., p. 37.
[4] Bull. Nutt. Orn. Club, 1879, p. 227.

August 23d, 1879, an old and young bird, which he took to be this species, although he did not secure them. Dr. Allen suggests that they may be Caspian Terns, a species which had just been found breeding at Cobb's Island, Va. As, however, the Royal Tern was later found to be very much more abundant at this point, it seems probable that Mr. Scott's surmise was correct. Mr. W. L. Baily saw one at Avalon August 26th and 27th, 1896, under similar conditions, and was unable to decide positively to which of these two species it belonged. The bird remained about the pier for hours.

67 Sterna sandvicensis acuflavida (Cabot).

Cabot's Tern.

Adults.—Length, 14–16. Wing, 12.50. Plumage similar to that of the Royal Tern, but bill black, tipped with yellowish.

A rare or accidental straggler from the South.

Turnbull mentions "one shot on Grassy Bay in August, 1861," which constitutes the only New Jersey record.

68 Sterna trudeaui Audubon.

Trudeau's Tern.

Adults.—Length, 15–16. Wing, 9.70–10.60. Above, head white, with a dusky stripe on the side involving the eye and running back over the ear-coverts; mantle, bluish-gray; tail-coverts and tail, white; below, pearl-gray, as well as the wings; bill, black in the middle; base and tip, yellowish. Lower parts white in winter.

A purely accidental straggler from South America.

Audubon (1839) says: "This beautiful Tern was procured at Great Egg Harbor, in New Jersey, by J. Trudeau, Esq." This is the only record. Curiously enough, the species was unknown at this time, so that this specimen became the type.

69 Sterna forsteri Nuttall.

Forster's Tern.

Adults.—Length, 14–15. Wing, 9.50–10.25. Similar to the Common Tern, but rump and under parts pure white, and tail pale gray, with the outer web of the outer tail feathers white.

Eggs, three to four; buff or brownish spotted with dark brown and lilac, 1.80 x 1.30.

A very rare straggler, if it still occurs at all on the coast.

Turnbull seems to have been the first to record this species in New Jersey. He says: "Rare; I have found it breeding on Brigantine Beach." Krider (1879) says: "Found on the shore of New Jersey with the Common Tern." Mr. Scott (1877) regarded it as rare on Long Beach, where he took a pair May 14th, 1877. Dr. W. L. Abbott secured specimens on Five Mile Beach May 15th, 1877; April 26th–May 17th, 1878; June 3d, 1879; May 6th, 1880; May 20th, 1881, and May 22d, 1882, along with the Common Tern, with which it must have been breeding. Mr. C. S. Shick (1890) records it as associated with the Common Tern on Seven Mile Beach, but not very common, where formerly it was abundant. This is apparently the last word we have of it as a New Jersey bird.

71 Sterna paradisaea Brünnich.

Arctic Tern.

Adults.—Length, 14–17. Wing, 10–10.50. Similar to the Common Tern, but much grayer below in summer, and with more white on the inner web of the primaries; tail longer and bill usually entirely red.

The evidence upon which this species is entered upon the New Jersey list is very unsatisfactory. At best, it was never more than the rarest straggler.

Bonaparte says (1826) that it is not rare in autumn on the New Jersey coast.[1] Audubon (1834) states that it is found in winter, "sometimes as far south as New Jersey," while Turnbull says, "Most

[1] Ann. N. Y. Lyc. Nat. Hist., II., p. 355.

numerous in autumn, an occasional straggler only being observed in winter." This is all, except two specimens said by Dr. Warren[1] to have been taken by Mr. C. D. Wood in September on the Delaware, below Philadelphia. In view of the fact that immature Terns were very poorly understood in the old days, and that there is only one valid record for this species as far south as Long Island, I feel grave doubts about its having occurred either on the Delaware or the New Jersey coast. There are no specimens extant from the State.

72 Sterna dougalli Montague.

Roseate Tern.

Adults.—Length, 14–17. Wing, 9.50. Similar to the Common Tern, but under surface tinted with pink; outer web of primaries, dark slate; tail, pure white; bill, black, red at the base.

Eggs, three, indistinguishable from those of the Common Tern.

Rare straggler, if it occurs at all in the State.

Turnbull (1869) is the first to mention this species as a New Jersey bird, the older ornithologists apparently confusing both this and Forster's Tern with the Common Tern, with which they associated. He regarded it (1869) as not uncommon. "H. A. R." (=Mr. Harry G. Parker)[2] (1888), speaking of Seven Mile Beach, says, "Now gone, formerly plentiful," and C. S. Shick (1890), while he thinks some still remain, says, "Much scarcer than five years ago, when it was an easy task to gather several bushels of eggs in a few hours."[3] Dr. W. L. Abbott, on his trips to Five Mile Beach (1877-1882) got no specimens of this species, and I have heard of none observed of late years. Mr. Chapman seems to have considered that they still occurred in southern New Jersey in 1906,[4] but I know of no evidence to support such a view.

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[1] Birds of Pennsylvania, p. 21.
[2] O. and O., XIV., p. 4.
[3] Auk, 1890, p. 327.
[4] Birds of vicinity New York, p. 136.

70 Sterna hirundo Linnæus.

Common Tern.

PLATE 5.

Adults.—Length, 13–16. Wing, 9.75–11.75. Above, pearl gray; top of head, black; tail slightly forked, white, with outer web of outer feathers gray; under parts, grayish-white; bill, red, tipped with black; feet, light red.

In winter fore part of head white, under parts whiter, and bill blackish.

Young in first summer like winter adults, but feathers on the back edged and mottled with brownish, and lesser wing-coverts dusky.

Nest simply a hollow in the sand, or on trash thrown up on the meadows; eggs, three to four, olive-brownish, or olive-gray blotched with brown, 1.80 x 1.30.

These beautiful birds, when undisturbed, nested in communities of hundreds or thousands. When one visited one of the colonies they rose in the air and circled about until the intruder had taken his departure. Their graceful flight, their immaculate plumage, and their weird chorus of protesting cries, all combined to add a charm to the seashore that nothing can ever replace. And they have been practically wiped out of existence for what? To be stuffed into grotesque shapes and stuck on a woman's hat—a purpose for which they were surely never created. They were not murdered and perched upon the milliner's creations because they look well there, for they are by this time mere caricatures of the graceful inhabitants of the shore, but because fashion demanded them and women were too weak to say no. Now we hear that they do not wear them. No! There are none to wear. And the Egret, too, has been all but exterminated from our coasts.

Formerly an abundant summer resident, breeding both on the "trash" thrown up by high tide on the meadows and on the sandy beach above high-water mark. Now reduced to a few small colonies or scattered pairs. Occurs from April to October. In 1881 they bred abundantly on the meadows back of Beach Haven (Morris), but by 1893 were so rare that Mr. G. S. Morris and I were astonished to find two pairs nesting July 23d, just above Atlantic City.[1] About Stone Harbor they still nest in small numbers, and I was informed of one colony of about 100 pairs that bred successfully in 1908. Several Terns of this species were seen on the upper Delaware September 5th,

[1] Bull. Nutt. Orn. Club, 1879, p. 227.

1907, by Mr. R. C. Harlow,[1] who considers it not uncommon on the river at this season. Two appeared at Cranbury Pond, near Princeton, October, 1898, and five were observed at Plainsboro by Mr. W. A. Babson, September, 1899.[2]

74 Sterna antillarum (Lesson).

Least Tern.

Adults.—Length, 8.50–9.75. Wing, 6. In color similar to the Common Tern, but forehead white and lores black; outer web of outer primaries dark slate, and bill yellow, tipped with black.

Nest merely a hollow in the sand; eggs, three, buffy white, with chocolate-brown markings, 1.25 x .95.

Now a very rare straggler, if it be not forever gone from New Jersey. Formerly a plentiful breeder along the sandy beaches above high water, arriving May 12th and departing August 25th, though some lingered until September 6th. Eggs from May 28th to July 5th.[3]

Wilson says: "During my whole stay [at their nesting site on the Cape May beaches] the birds flew in clouds around me, and often within a few yards of my head, squeaking like so many young pigs." Scott (1879): "Abundant [at Long Beach], breeding exclusively on the ocean beach." Mr. G. S. Morris, writing of the same spot in 1881, says: "The Least Terns bred in considerable numbers, and were equally vociferous in their protests against intruders. It is difficult, at this late date (1909), to give an estimate of numbers, but I can remember standing in one spot and seeing five or six nests within a radius of fifteen or twenty feet, but my recollections are that these conditions only pertained to an acre or so of the beach. In the summer of 1884, in July, I could find no Least Terns' eggs, and natives told me they no longer found eggs on the beach.[4] During the period 1881-1886 I saw a good deal of the slaughter of the birds in this region. I remember coming

[1] Cassinia, 1907, p. 85.

[2] Birds of Princeton, p. 35.

[3] Scott, Long Beach, Bull. Nutt. Orn. Club, 1879, p. 227.

[4] One set is in the collection of Mrs. Drown, of Weldon, Pa., taken June 26th, 1883, at Beach Haven.

upon two professional millinery gunners, I think in the summer of 1885, who had two piles about knee high of Least and Common Terns, which they said they were sending to New York, my recollection being that they got twelve cents apiece for the birds."

Dr. Warren describes the same thing on Brigantine in the summer of 1883; he says, "The Least Terns were breeding in considerable numbers, laying their eggs in slight depressions in the dry sand and among the shells on the sand hills along the beach. I obtained the bodies of over 75 of these Terns from two taxidermists, who were collecting the skins for New York and Philadelphia dealers, to be used for ladies' hats. These birds were all killed in one day."

On Seven Mile Beach Mr. C. S. Shick writes in 1890 that the Least Tern is a very common breeder. "I must state, however, that all of the Terns are gradually forsaking their former breeding grounds on account of the new seaside resorts that are being started on all the islands. Formerly many hundred pairs occupied a small sand flat near Sea Isle City, but they are now all gone, not one pair breeding where a few years ago hundreds raised their young." Mr. H. G. Parker in 1888 estimated that there were only 30 pairs left on Seven Mile Beach, and Mr. Philip Laurent (1892) says that some still bred there. Since then we have no definite breeding record, but Mr. W. L. Baily saw two birds together at Stone Harbor, July 15th, 1899, which he felt sure were nesting. He saw single birds also on the following dates: Holly Beach, June 1st, 1893; Stone Harbor, August 28th, 1896, and Cape May, August 22d, 1897.

75 Sterna fuscata Linnæus.

Sooty Tern.

Adults.—Length, 15–17. Wing, 12. Above, brownish-black; forehead and line to the eye, white; outer pair of tail feathers, mainly white; under parts, white; bill and feet, black.

Very rare straggler; probably does not now occur.

Dr. C. C. Abbott gives this species as "rare in summer," with no definite data. One specimen was, however, shot by Mr. A. P. Brown on Long Beach in the "seventies," which I have frequently examined.

77 Hydrochelidon nigra surinamensis (Gmelin).

Black Tern.

Adults.—Length, 9–10. Wing, 8.25. Back, wings and tail, slate color; rest of plumage, black; bill and feet, black; shafts of primaries, white.

In autumn.—Forehead, white; top of head and neck dusky, edged with white; black in front and behind the eye; rest of upper parts, dark gray; under parts, white; gray on sides of breast.

Young in first autumn.—Similar, but edged with brownish above.

An irregular migrant on the coast during late summer and autumn, sometimes very abundant. Occasional on the large rivers.

Wilson received his first specimen of this supposedly new species of Tern from Mr. Beesley, of Great Egg Harbor. Soon after, on the 6th of September, 1812, he tells us "after a violent northeast storm, numerous flocks of this Tern appeared on the Schuylkill meadows. Some hundreds of them might be seen at the same time." Mr. Scott observed them at Long Beach in 1877, the first one arriving on June 11th. In a few days they became very common, and remained all summer in large numbers, being still present September 1st. Many were immature, and only one in ten was in the black plumage. All were moulting.[1]

Mr. Rhoads found them plentiful at Beach Haven September 8th to 12th, 1881,[2] and Mr. D. N. McCadden[3] reported them at Stone Harbor in flocks of fifty August 4th to 18th, 1899, feeding like swallows over the meadows. Dr. Braislin observed them[4] commonly opposite Forked River August 22d to 25th, 1908.

Mr. W. D. Miller[5] reports the unusual abundance of the Black Tern from early August to the end of September, 1906, about the Newark marshes, etc., where they were last seen October 6th. One was seen on the Delaware, opposite Philadelphia, on October 20th of the same year by Mr. R. F. Miller, and on September 5th, 1907, a flock was observed above the city and several secured by Mr. R. C. Harlow.[6]

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[1] Bull. Nutt. Orn. Club, 1879, p. 227.
[2] Colln. Acad. Nat. Sci., Phila.
[3] Abst. Proc. Del. Valley Orn. Club, IV., p. 5.
[4] Cassinia, 1908, p. 42.
[5] Bird Lore, 1906, p. 211.
[6] Cassinia, 1907, p. 85.

Family RYNCHOPIDÆ.

The Skimmers.

These curious birds, allied to the Terns in general structure, are peculiar in their compressed bill, the two mandibles almost like vertical knife blades and the lower much longer than the upper. When feeding, the bird skims the surface with its mouth open and the lower mandible in the water, scooping up such small animals as come in its way. We have but one species in America.

80 Rynchops nigra Linnæus.

Black Skimmer.

Adults.—Length, 17–20. Wing, 14.75–15.75. Above, black; most of the tail feathers and tips of secondaries, white, as well as the forehead, sides of the head and entire under parts; bill, orange for basal half, tip black.

Young in first autumn more dusky, with white edgings to feathers.

Nest a mere hollow in the sand; eggs, three to four, white or pale buff, with heavy chocolate and lilac markings, 1.75 x 1.30.

A rare straggler from the South. Formerly a common summer resident on the southern New Jersey coast.

Wilson says: "Its favorite haunts are low sand bars raised above the reach of the summer tides, and also dry flat sands on the beach in front of the ocean. It lays early in June. Half a bushel and more of eggs has sometimes been collected from one sand bar within the compass of half an acre." Krider (1879)[1] states that they breed on all the beaches of Cape May county, and Scott[2] (1877) reports them rather rare on Long Beach, which he regards as their northern limit. A set of eggs was taken there July 29th, 1882, which is now in Mrs. E. Drown's collection. On Brigantine Beach and at Little Egg Harbor Scott states they breed in numbers. Dr. W. L. Abbott collected a number of specimens September 13th-14th, 1880, at Five Mile Beach, but Mr. Laurent[3] saw none there in 1892. On Seven Mile Beach they bred

[1] Field Notes, p. 82.
[2] Bull. Nutt. Orn. Club, 1879, p. 227.
[3] O. and O., 1892, p. 43.

in 1886, according to Mr. H. G. Parker,[1] and Mr. C. S. Shick[2] states that he found seventy-five nests in 1885 and 1886, and in 1890 reported them still present, but very rare.[3] I saw a few late that summer off Cape May; Mr. I. N. DeHaven saw two at Atlantic City August 1st, 1887,[4] and a specimen was shot at Tuckerton in August, 1893, by Mr. A. H. Jillson.

Order TUBINARES.

Tube-Nosed Swimmers.

Family PROCELLARIIDÆ.

THE PETRELS AND SHEARWATERS.

The Petrels are more strictly pelagic than any of our other water birds, and are only seen near the shore when driven in by storms.

They are web-footed, with a very small or rudimentary hind toe, and are very strong on the wing, scouring the ocean for long periods without coming to rest, the smaller species recalling the swallows among land birds. The upper mandible is strongly hooked at the tip, but the most peculiar characteristic of the Petrels and their allies is the curious tubular nostrils which lie horizontally on top of the bill.

a. Length, 16–22.
  b. Lower parts white.
    c. Head white. FULMAR, p. 67
    cc. Upper parts entirely smoky gray.
      d. White of throat, etc., sharply separated from dusky of upper parts of head. GREATER SHEARWATER, p. 67
      dd. White of throat, etc., not sharply separated from dusky. CORY'S SHEARWATER, p. 67
  bb. Entire plumage gray or sooty.
    c. Length, 18–20. FULMAR (dark phase), p. 67
    cc. Length, 16. SOOTY SHEARWATER, p. 68
aa. Length, 11; blackish above, white beneath. AUDUBON'S SHEARWATER, p. 68
aaa. Length, 5.50–8.50.
  b. Tarsus, 1.30. WILSON'S PETREL, p. 70
  bb. Tarsus, .90.
    c. Length, 5.50. STORMY PETREL, p. 69
    cc. Length, 7.50–8. LEACH'S PETREL, p. 69

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[1] O. and O., 1886, p. 138.
[2] O. and O., 1887, p. 102.
[3] Auk, 1890.
[4] Forest and Stream, September 1st, 1887, p. 105.

86 Fulmarus glacialis (Linnæus).

Fulmar.

Adults.—Length, 18–20. Wing, 12.50–13.50. Back, wings and tail, pale gray; a dusky spot before the eye; rest of plumage, white; sometimes the entire plumage is dull brownish-gray.

Accidental straggler from the North. There is only one record, a bird picked up in an exhausted condition in Bergen county (near Ridgewood), December, 1891, by Mr. Henry Hales.[1]

88 Puffinus borealis Cory.

Cory's Shearwater.

Adults.—Length, 20–22. Wing, 13.75–14.50. Above, brownish-black; below, white; no sharp line of demarcation on the side of the throat.

A pelagic species rarely straggling in to the coast. Dr. William C. Braislin obtained two specimens of this species off Fire Island Inlet October 4th, 1902,[2] and in August, 1908, saw several Shearwaters, which he considered were the same species, on the ocean off Forked River.[3]

89 Puffinus gravis (O'Reilly).

Greater Shearwater.

Adults.—Length, 19–20. Wing, 11.50–13. Above, brownish-black; below, white; ashy on the abdomen and under tail-coverts. Differs from the preceding in having the white of the throat, etc., abruptly separated from the dusky of the upper part of the head and neck.

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[1] O. and O., 1892, p. 39.
[2] Auk, 1904, p. 287.
[3] Cassinia, 1908, p. 42.

Pelagic, rarely straggling in to the coast.

Turnbull says very rare; a few seen every year on the Atlantic off the coast. Chapman says it is irregularly common, from early June to October, off the coast.[1] We have no record of capture on the New Jersey coast.

92 Puffinus l'herminieri Lesson.

Audubon's Shearwater.

Adults.—Length, 11. Wing, 7.60–8.40. Above, black; below, white; running well up on the lores and nearly to the eye.

Very rare straggler from the South.

Audubon's Shearwater has been taken on Long Island, and is probably the bird mentioned by Turnbull, under the name Manx Shearwater, as an accidental visitor to the coast in autumn. Mr. Ridgway includes New Jersey in its range in his manual.

94 Puffinus griseus (Gmelin).

Sooty Shearwater.

Adults.—Length, 16. Wing, 11.50–12. Entire plumage, sooty black; slightly lighter below.

Occasional off the coast, June to November.

A pelagic species, occasionally straggling in to the coast. Turnbull says, "Occasional along the sea shore, from the South," and Chapman regards it as much less common than the Greater Shearwater.

Curiously enough, all the Shearwaters captured on the New Jersey coast belong to this species. The records are as follows:

Delaware Bay; 1858. Thos. Beesley.[2]

Below Atlantic City; June 3d, 1893. Prof. J. Remington.[2]

Fishing banks off Five Mile Beach. Capt. John Taylor[3] (two specimens).

Sea Isle City; May 25th, 1898. Theo. L. DeBow.[2]

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[1] Birds Vicin. of N. Y., 1906, p. 138.

[2] Coll. Acad. Nat. Sci., Phila.

[3] Laurent, O. and O., 1892, p. 43.

104 Thalassidroma pelagica (Linnæus).

Storm Petrel.

Adults.—Length, 5.50–5.75. Wing, 4.50–4.90. Plumage similar to that of Wilson's Petrel, from which it is easily distinguished by its smaller size and much shorter feet—tarsus, .90–.95.

There seems to be no record of this species from New Jersey, nor is it certain that it occurs even off our coasts. The only evidence of the latter is a statement of Lawrence's for New York, and one of Krider's referring to a specimen secured at Philadelphia after a storm.[1] The little Petrels were so much confused in the old days, however, that these statements might easily have referred to either of the other species.

106 Oceanodroma leucorhoa (Vieillot).

Leach's Petrel.

PLATE 6.

Adults.—Length, 7.50–8.50. Wing, 6–6.25. Entire plumage, sooty brownish-black, except the upper tail-coverts, which are white, somewhat mottled with blackish; tail, distinctly forked; feet, entirely black.

Pelagic, occurring off our coast during the autumn and winter, retiring to the coasts and islands from Maine northward to breed.

Turnbull states that a number were driven inland in August, 1842, during a gale.

December 18th, 1890, one was taken by Mr. W. V. Wilbank,[2] on the Delaware River at Tinicum, and Mr. I. N. DeHaven secured another on the thoroughfare at Atlantic City August 24th, 1893.[2] Both of these I have examined.

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[1] Field Notes, p. 79.

[2] Stone, Birds of E. Pa. and N. J., p. 50.

109 Oceanites oceanicus (Kuhl).

Wilson's Petrel.

Adults.—Length, 7–7.25. Wing, 5.75–6.20. Similar to Leach's Petrel, but under tail-coverts mottled with white; wing-coverts with whitish edges, and webs of feet mainly yellow; tail, square; feet much longer—tarsus, 1.30–1.35.

A common bird on the ocean off our coast from May to September, occasionally coming in shore or up the rivers during storms. Retires to Kerguelen Island, in the Southern Ocean, to breed in January and February. Krider took one in Delaware Bay,[1] and Scott secured several from a large flock off Barnegat Light August 10th, 1877.[2] Laurent[3] reports it as common on the fishing banks off Five Mile Beach, and Chapman[4] observed numbers of Petrels [presumably this species] off the Delaware coast May 9th, 1897.

A dead bird was found on the beach at Point Pleasant, N. J., by Dr. A. P. Brown.[5]

Order STEGANOPODES.

Totipalmate Swimmers.

The birds comprising this order are distinguished from all other swimming birds by the fact that the hind toe is connected with the inner toe by a web, making three webs instead of two, as in the ducks and gulls. The several families are distinguished as follows:

a. Tip of upper mandible with a distinct hook or "nail" at the tip.
  b. Bill 10–15 long, with large pouch. PELICANS, p. 73
  bb. Bill 2–3 long, scarcely any pouch. CORMORANTS, p. 72
aa. Tip of upper mandible without a distinct hook. GANNETS, p. 71

[1] Field Notes, p. 79.
[2] Bull. Nutt. Orn. Club, 1879, p. 228.
[3] O. and O., 1892, p. 43.
[4] Abst. Proc. Linn. Soc. N. Y., X., p. 2.
[5] Abst. Proc. D. V. O. C., I., p. 11.

Family SULIDÆ.

The Gannets.

The Gannets and Boobies, which comprise this family, are large birds with a powerful, heavy bill, somewhat serrate on its edges near the tip. They secure the fish upon which they live by diving for them from some distance up in the air. Our only species, the Gannet, nests on Bird Rock in the Gulf of St. Lawrence, and occurs in New Jersey only as a transient.

117 Sula bassana (Linnæus).

Gannet.

Adults.—Length, 30–40. Wing, 19.50. Plumage, white; head and neck washed with straw color; primaries, brownish-black.

Young in first autumn and winter.—Above, and whole head, neck and throat, grayish-brown, thickly marked with triangular white spots; tail, white at base; breast and abdomen, white; all feathers bordered with grayish-brown.

A spring and fall migrant, usually keeping well off shore, but occasionally coming in to the coast or up the rivers.

Mr. H. W. Hand tells me that they remain in varying numbers off the capes of Delaware Bay all winter, and May 25th, 1890, one was captured on the Delaware, at Salem,[1] by Messrs. S. B. Irwin and J. H. Cullen.

One was taken the same year at Atlantic City,[1] and one on April 26th, on the fishing banks off Five Mile Beach, by Capt. John Taylor.[2] A young bird in the brown plumage was shot at Holly Beach November 22d, 1897.[3] Mr. Hand reports them seen off Cape May March 14th, 1903; March 18th, 1907; February 25th, 1906.

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[1] Stone, Birds of E. Pa. and N. J., p. 50.
[2] Laurent, O. and O., 1892, p. 43.
[3] Colln. Acad. Nat. Sci., Phila.

Family PHALACROCORACIDÆ.

The Cormorants.

The Cormorants are fish-eating birds, and secure their prey by diving duck fashion from the surface of the sea, and then pursuing it under the water. They resemble large-sized ducks also when flying. In structure their slight throat pouch recalls the much larger structure of the Pelicans. They do not nest between the Bay of Funday, the southern breeding limit of the Double-crested Cormorant, and North Carolina, the northern limit of the Florida Cormorant.

119 Phalacrocorax carbo (Linnæus).

Cormorant.

Adults.—Length, 34–40. Wing, 12.90–14. Differs from the Double-crested Cormorant, which is the common New Jersey species, in the presence of a white patch at the base of the throat pouch and of slender white hair-like feathers on the head in the nuptial plumage. There are, moreover, fourteen tail feathers instead of twelve.

A very rare straggler from the North in winter.

Lawrence reports it as occurring as far south as New Jersey,[1] and Turnbull calls it rather rare. A specimen is recorded by Mr. C. E. Bellows as taken at Bridgeton, N. J., apparently in 1883.[2]

This species is so frequently confused with the Double-crested Cormorant that I am very skeptical about the accuracy of any of the above statements. The species does, however, occur rarely on Long Island.

120 Phalacrocorax auritus (Lesson).

Double-crested Cormorant.

Adults.—Length, 29–33. Wing, 12–13. General color, glossy black; feathers of back, scapulars and wing-coverts with grayish centers; a tuft of black feathers on each side of the head. In winter the tufts are lacking.

Young in first autumn duller and browner above, brown below, paler on the neck and breast.

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[1] Birds of N. A., p. 876.

[2] O. and O., 1883, p. 16.

A common spring and fall migrant, and occasional winter resident. Mr. H. W. Hand tells me that they arrive in the spring, from March 23d to April 21st, and sometimes linger until June 1st, and Mr. W. L. Baily saw a flock of one hundred off Sea Isle City May 23d, 1887, and one August 30th, 1896, at Wildwood. At Atlantic City I saw one bird as late as June 19th, 1892, and Mr. R. C. Harlow saw three at Beach Haven June 11th, 1907. They return in September and October, and Mr. I. N. DeHaven took several at Atlantic City February, 1895. They usually migrate just off shore, but occasionally come in over the bays and even up the rivers. Mr. S. N. Rhoads reports some seen on the Delaware at Camden, and Mr. H. W. Fowler records two killed at Burlington Island. Mr. Thurber states that one was shot at Littleton, Morris county, October, 1880, but they are very rare inland.

Family PELECANIDÆ.

The Pelicans.

Like the other allied families, the Pelicans are fishing birds, and are provided with a curious distensible sack hanging from the lower mandible. The White Pelican scoops up its fish while swimming, but the Brown Pelican secures his food by diving.

125 Pelecanus erythrorhynchos Gmelin.

White Pelican.

Adults.—Length, 55–70. Wing, 20–25. White with black primaries.

A rare straggler in former years.

Turnbull says that it has been seen at rare intervals on the Delaware and on the sea coast near Cape May, and T. R. Peale[1] records a pair captured a few miles below Philadelphia on the Delaware. Dr. C. C. Abbott refers to a mounted specimen said to have been killed near Tuckerton, and says that he saw three of these birds flying off Sandy Hook in February, 1864.

[1] Water Birds of N. A., II., p. 137.

126 Pelecanus occidentalis (Linnæus).

Brown Pelican.

PLATE 7.

Adults.—Length, 50–54. Wing, 19–21. Chocolate-brown below with long silvery-gray feathers covering the upper parts, with a chestnut patch on the fore part of the back and a chestnut stripe on the occiput; head, straw-yellow, with a white stripe down the side of the neck and a straw-yellow patch on the breast. After the breeding season the whole head is white, tinged with yellow.

Young in first year.—Similar, but duller, and head tinged with gray.

Rare straggler from the South.

Turnbull records one specimen shot off Sandy Hook in 1837 in summer, and Mr. W. H. Werner tells me that one was shot at Ventnor and brought to him in May, 1902.[1] Another was wounded and captured by Mr. Walter Layton, at Townsend's Inlet, May 5th, 1909.

Order ANSERES.

Lamellirostral Swimmers.

Family ANATIDÆ.

THE DUCKS AND GEESE.

The striking peculiarity of the birds of this family is the curious flat bill with rows of fine narrow plates on either side, like the teeth of a comb, which act as strainers, holding the food while the water drains off.

The Mergansers (*Merginæ*) have a much narrower bill, recalling that of the Cormorant, and like it, they feed upon fish which they catch while under the water. (P. 78.)

The River Ducks (*Anatinæ*) feed usually in shallow water, where they can reach bottom by simply "tilting up." Small aquatic animals and plants constitute their food. (P. 79.)

The Sea Ducks (*Fuligulinæ*) feed on the same materials, but dive for them. They may be distinguished from the former group by

[1] Referred to by S. R. Morse, N. J. State Mus. Rept., 1903, p. 56.

having a flap or lobe on the small hind toe, which is lacking in the *Anatinæ*. (P. 86.)

The Geese (*Anserinæ*) have a blunt, heavy bill, the result of feeding on land upon grass, etc., though they also pluck various aquatic plants from the shallow water. (P. 93.)

The Swans (*Cygninæ*) are distinguished by their very long necks and bare lores. (P. 96.)

a. Neck longer than the body. WHISTLING SWAN, p. 96
aa. Neck shorter than the body.
b. Tarsus longer than the middle toe without the claw. (Geese)
c. Forehead white, head brown. WHITE-FRONTED GOOSE, p. 94
cc. Entire head brown.
d. Back brown. WHITE-FRONTED GOOSE (young), p. 94
dd. Back dark gray. BLUE GOOSE (young), p. 94
ccc. Entire head white (often stained rusty).
d. Body dark gray. BLUE GOOSE, p. 94
dd. Body white.
e. Wing under 17. LESSER SNOW GOOSE, p. 93
ee. Wing over 17.25. GREATER SNOW GOOSE, p. 93
cccc. Entire head pale gray. Immature SNOW GEESE, p. 93
ccccc. Entire head black.
d. Throat white. CANADA GOOSE, p. 95
dd. Throat black, neck speckled with white.
e. Belly white. BRANT, p. 95
ee. Belly dark gray. BLACK BRANT, p. 96
bb. Tarsus shorter than the middle toe without the claw. (Ducks)
c. Bill very slender and narrow, nearly round in cross-section.
d. Bill not over 1.50. HOODED MERGANSER, p. 79
dd. Bill not under 1.80.
e. Head black.
f. Breast streaked with black.
RED-BREASTED MERGANSER (male), p. 78
ff. Breast not streaked.
MERGANSER (male), p. 78
ee. Head rusty red or gray.
f. Bill from nostril to tip 1.25 or less.
MERGANSER (female), p. 78
ff. Bill from nostril to tip 1.50 or more.
RED-BREASTED MERGANSER (female), p. 78
cc. Bill broader, flat and duck-like.
d. Head and neck rusty or reddish-brown.
e. Crown white. EUROPEAN WIDGEON, p. 81
ee. Sides of face white. RUDDY DUCK, p. 93
eee. Sides of head black. GREEN-WINGED TEAL, p. 83
eeee. Crown and face uniform with rest of head.
f. Flanks barred like the back, bill 2 or less.
REDHEAD, p. 86
ff. Flanks with scarcely a trace of bars, bill over 2. CANVASBACK, p. 86

dd. Head more or less metallic, green or blue.
e. Entirely green.
f. "Shoulder" of wing blue, speculum green.
SHOVELLER, p. 84
ff. Shoulder brown, speculum purplish-blue.
MALLARD, p. 79
ee. Green, marked with white and purple, and crested.
WOOD DUCK, p. 85
eee. Green back of eye and down the neck, rest of head speckled. BALDPATE, p. 82
ddd. Head black with green or purplish reflections.
e. A large white patch behind the eye.
BUFFLEHEAD, p. 89
ee. A white spot at the base of the bill.
GOLDEN-EYED DUCK, p. 88
eee. No white marks on head.
f. A chestnut collar at base of neck, speculum gray. RING-NECK DUCK, p. 88
ff. No chestnut collar, speculum white.
g. Flanks white. SCAUP DUCK, p. 87
gg. Flanks mottled with dusky.
LESSER SCAUP DUCK, p. 87
dddd. Head jet black without reflections, under parts black.
e. A white spot on crown or cheeks, tail long.
OLD-SQUAW, p. 89
ee. A white patch on the nape and sometimes on the forehead. SURF SCOTER, p. 92
eee. A white spot before the eye and white speculum.
WHITE-WINGED SCOTER, p. 92
eeee. No white markings. AMERICAN SCOTER, p. 92
ddddd. Head plain brown or brownish, with or without white markings.
e. Speculum gray.
f. Wing, 8.75–9.
g. Bill 2 or less.
REDHEAD (female), p. 86
gg. Bill over 2.
CANVASBACK (female), p. 86
ff. Wing, 7.50. RINGNECK (female), p. 88
ee. Speculum white.
f. Breast entirely white.
g. A white patch below and behind the eye. BUFFLEHEAD (female), p. 89
gg. A white spot at the base of the bill.
GOLDEN-EYE DUCK (female), p. 88
ff. Breast dusky brown or rusty.
g. No white spot behind the eye.
h. Bill, 2.
SCAUP DUCK (female), p. 87
hh. Bill, 1.75.
LESSER SCAUP DUCK (female), p. 87

gg. A white spot behind the eye.
h. Wing, 11.
WHITE-WINGED SCOTER (female), p. 92
hh. Wing, 7.80.
HARLEQUIN DUCK (female), p. 90
hhh. Wing, 5.90.
RUDDY DUCK (female), p. 93

d^6. Head brown, with a white stripe down the side of the neck and a long tail. PINTAIL (female), p. 84

d^7. Head and entire plumage gray-blue, with irregular black and white markings. HARLEQUIN DUCK (female), p. 90

d^8. Head gray, with a white spot at the base of the bill and blue "shoulder" to the wing.
BLUE-WINGED TEAL (female), p. 83

d^9. Head gray, white around the eye and base of the bill, throat white. WOOD DUCK (female), p. 85

d^{10}. Head white, sides of face gray, long tail.
OLD-SQUAW (female), p. 89

d^{11}. Head largely white, with a pea green patch on the sides of the face.
e. Crown gray. KING EIDER, p. 91
ee. Crown black. EIDER, p. 91

d^{12}. Head and neck buff or whitish, finely streaked or speckled with black.
e. Shoulder of wing blue.
f. Chin and patch at base of bill pure white.
BLUE-WINGED TEAL, p. 83
ff. Chin and base of bill uniformly speckled.
SHOVELLER, p. 84

ee. Shoulder dull brownish.
f. Speculum purplish-blue.
g. A white border to blue of speculum.
MALLARD (female), p. 79
gg. No white border.
BLACK DUCK (female), p. 80
ff. Speculum green, edged with buff.
GREEN-WINGED TEAL (female), p. 83
fff. Speculum black and white (or pearl gray).
g. Sides of body rufous. BALDPATE, p. 82
gg. Sides narrowly barred, black and white. GADWALL (young male), p. 81
ggg. Sides coarsely mottled, brown and buff. GADWALL (female), p. 81
ffff. Speculum white.
WHITE-WINGED SCOTER, p. 92
fffff. Speculum brownish, edged with cinnamon above and black and white below.
PINTAIL (female), p. 84

f^6. Speculum plain gray.
RINGNECK DUCK (female), p. 88

f^7. No speculum at all.
Female EIDER DUCKS, p. 91

129 Mergus americanus Cassin.

Merganser, Fresh-water Shelldrake.

PLATE 8.

Adult male.—Length, 21–24. Wing, 9.60–9.75. Head and throat, all around glossy greenish-black; upper back, black; lower back, rump and tail, gray; wing-coverts and secondaries, mainly white; under parts and entire neck white, tinged with salmon in life.

Adult female.—Head crested, rufous, as is the fore neck all around; throat, whitish; entire upper parts, gray; lower parts, white; a white wing speculum.

Winter resident on the coast, and more especially on Delaware Bay and some distance up the river. October 15th to May 1st. Mr. Babson[1] records one taken at Princeton March 10th, 1881, and another November 18th, 1898, and one was seen near Medford, October 27th, 1901, by Mr. G. S. Morris,[2] but it does not seem to be common inland. Mr. G. E. Hix[3] records a flock of 150 at Englewood, February 12th, 1907, but Mr. Chapman regards it as not common in that vicinity. Mr. Thurber states that it is rare at Morristown.

130 Mergus serrator Linnæus.

Red-breasted Merganser, Shelldrake, Fish Duck.

Adult male.—Length, 20–25. Wing, 8.60–9. Entire throat black, somewhat glossed with green; head crested, broad ring all around the neck white, behind which is a rusty band speckled with black, which does not quite meet behind; whole back, black; wings, largely white; sides and rump narrowly vermiculated with black and white; lower parts, white; feet and bill, red.

Young male in first winter.—Similar, but back and rump largely gray; head crested, grayish-brown; neck, gray above; throat and neck below, dull rusty; rusty breast-band very poorly defined; rest of under parts, white.

Adult female.—Similar, but dull gray above, and breast slightly dusky; no rusty.

Common migrant, and often winter resident.

Owing to the general confusion between this and the following, I am inclined to think that some misstatements have been made regarding their relative abundance. This species is said by Messrs. Willits, Laurent, Braislin and Scott to be very common on the coast at Barne-

[1] Birds of Princeton, p. 35.
[2] Cassinia, 1901, p. 51.
[3] Abst. Proc. Linn. Soc., N. Y., XIX., p. 28.

gat Bay and Five Mile Beach, while the larger species is uniformly reported rare, and Mr. Chapman makes the same statement for the vicinity of New York. Occurs from October 15th to May 15th. Turnbull (1869) states that a few remain all summer, and Captain Taylor and Mr. Laurent report this to be the case at Anglesea, while Mr. Scott found them in summer at Long Beach and Little Egg Harbor. At the latter place he shot one June 28th, which seemed to be a barren bird. No doubt, as he suggests, the summer stragglers are all of this character.

Occasional on the Delaware. Mr. Babson reports only one record at Princeton, taken by Professor Philips, March 16th, 1881.

131 Lophodytes cucullatus (Linnæus).

Hooded Merganser, Cock Robin.

Adult male.—Length, 17.25–19.25. Wing, 7.50–7.90. Upper parts head and throat, glossy black; a broad fan-shaped crest on back of the head white, bordered with black; shoulders transversely barred with black and white; sides finely barred with black and rufous; lesser wing-coverts, gray; a white speculum and tertials striped longitudinally with white; breast and abdomen, white; under tail-coverts mottled with gray.

Adult female.—Above grayish-brown; crest tinged with rufous; a white speculum; throat, white; neck and upper breast, gray; rest of under parts, white; sides, brownish-gray.

Transient, and occasional in winter, but not common or regular. It was apparently much more plentiful formerly. Occasional also on the Delaware. November 15th to March 25th.

132 Anas platyrhynchos Linnæus.

Mallard.

Adult male.—Length, 20–25. Wing, 10.25–12. Head and neck all around, glossy green; whole breast deep chestnut, separated from the green by a white collar; back, grayish-brown; abdomen, sides and scapulars dull white, vermiculated with gray; a metallic blue speculum preceded by a black and white bar; edge of the tertials and scapulars over the speculum, chestnut; rump and under tail-coverts glossy black, tinged with green; sides of tail, white.

Adult female.—Brown above, edged with buff; speculum as in male; head buff, narrowly streaked with dusky; uniform dusky on the crown; throat, unstreaked; breast and abdomen grayish-brown, streaked or mottled with dusky.

Regular and common on Delaware Bay and for some distance up the river. Rare on the coast. Mr. Chapman[1] regards it as irregular about New York City. Mr. Hann[2] finds it uncommon at Summit, and Mr. Babson at Princeton.[3] Mr. Laurent[4] records two secured in winter at Anglesea, where it is rare. Dr. C. C. Abbott (1868) states that it formerly bred in Mercer county. Occurs from October 15th to April 1st.

Mr. L. I. Smith[5] secured an interesting hybrid between the Mallard and Black Duck on the Delaware, March 13th, 1901.

133a Anas rubripes Brewster.

Red-legged Black Duck.

Similar to the following, but throat streaked like the neck, instead of plain, and legs red instead of dull greenish.

A migrant from far northward, occurring also in winter; less abundant than the common Black Duck.

133 Anas rubripes tristis Brewster.

Black Duck.

Adults.—Length, 21–24. Wing, 10.50–11.50. Crown, blackish; rest of head and neck grayish-buff, narrowly streaked with black; upper parts, blackish-brown; lower parts dark brown, with buff edgings; a metallic blue speculum. *Nest* on the ground, made of weeds, grass, etc., lined with feathers and down. Eggs, six to twelve, greenish-buff, 2.30 x 1.70.

Abundant migrant and winter resident both on the coast and on the fresh-water bays and rivers from October 15th to April 1st.

Formerly bred regularly along the coast, and does so still in small numbers. Mr. W. L. Baily found a nest at Ocean View March 30th,

[1] Birds Vicinity N. Y., p. 139.
[2] Wilson Bull., 1905, p. 119.
[3] Birds of Princeton, p. 36.
[4] O. and O., 1892, p. 43.
[5] Cassinia, 1901, p. 48.

1901,[1] but some unprincipled gunner killed the female before she had laid any eggs. Mr. W. W. Justice, Jr., tells me that some are reported nesting every year on the shores of Barnegat Bay. At the mouth of the Egg Harbor River a nest with a full set of eggs was found May, 22d, 1908, by Mr. R. T. Moore.[2] Mr. W. B. Crispin reports young birds seen by residents near Salem, but he never found a nest.

135 **Chaulelasmus streperus** (Linnæus).

Gadwall, Gray Duck.

Adult male.—Length, 19–21. Wing, 10–11. Head brownish-white, darker above, thickly speckled with black; breast, neck, scapulars and fore part of back black, thickly covered with concentric white marks producing a scaled appearance; lower back, dull brown; upper and lower tail-coverts, black; abdomen, white; sides vermiculated, black and white; a white wing speculum preceded by a black patch and some chestnut edgings.

Adult female.—Head buff or slightly rufous, finely speckled with black; upper parts, blackish-brown; feathers all edged and spotted with buff or cinnamon; wing speculum brown edged, with black and buffy white; greater-coverts edged with cinnamon; under parts, dull white; breast and neck buff and speckled with black; sides like the back.

Rare transient. Individuals are occasionally shot on the coast or on Delaware Bay.

One was obtained early in March, 1900, on Delaware Bay.[3]

136 **Mareca penelope** (Linnæus).

European Widgeon.

Adult male.—Length, 18–20. Wing, 10–11. Head, light chestnut; crown, white; back and sides finely vermiculated with white and black, much lighter than in the Baldpate; breast, vinaceous; abdomen, white; speculum glossy green, bordered before and behind with black; wing-coverts, white.

A rare straggler from Europe.

Turnbull (1869) says some are met with almost every season.

One was obtained in 1855 in the Philadelphia market, apparently

[1] Cassinia, 1901, p. 48.

[2] Cassinia, 1908, p. 29.

[3] Abst. Proc. Del. Valley Orn. Club, IV., p. 4.

taken at Tuckerton.[1] Another was taken on the Delaware March, 1887,[2] and still others at Tuckerton.[3] Mr. Chapman[4] also records one killed at Leonia by C. Demarest in spring of 1880 or 1881, and Mr. DeL. Berier states, on the authority of Mr. Chas. W. Moxon, that several were killed on Barnegat Bay during the season of 1878-79.

137 Mareca americana (Gmelin).

Baldpate, Widgeon.

Adult male.—Length, 18–22. Wing, 10.25–11. Head and neck white, tinged with buff, and thickly speckled with black; crown, pure white; behind the eye and back of the neck tinged with bronze-green; breast and sides vinaceous, the latter vermiculated with black; back, vinaceous gray; gray on rump finely vermiculated with black; wing, largely white; a black speculum with bronze-green band; tertials black on outer web; under parts of body, white; under tail-coverts, black.

Adult female.—Similar to female Gadwall, but speculum gray, preceded by a black patch, and abdomen speckled with obscure grayish-brown spots.

Irregular transient on the coast and about New York City. More frequent on Delaware Bay. Most frequently seen during October and November. One was taken at Washington's Crossing, on the upper Delaware, April 14th, 1905, by Mr. J. G. Dillen, and Thurber gives it as a rare migrant at Morristown.

138 Nettion crecca (Linnæus).

European Teal.

Similar in size and coloration to the American Green-winged Teal, but the adult male lacks the diagonal white bar at the shoulder and has the vermiculations of the upper parts coarser.

Accidental straggler from Europe. Dr. C. C. Abbott in his Report on the Birds of New Jersey (1868) records one taken at Trenton.

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[1] Proc. Bost. Soc. Nat. Hist., V., p. 195.

[2] Stone, Birds of E. Pa. and N. J., p. 55.

[3] Forest and Stream, 1882, p. 86, and Proc. Bost. Soc., N. H., III., p. 21; VI., p. 376.

[4] Auk, 1889, p. 302.

139 Nettion carolinensis (Gmelin).

Green-winged Teal.

Adult male.—Length, 12.50–15. Wing, 6.25–7.25. Head, chestnut; throat and broad band from the eye to the nape, metallic green; upper parts and sides finely vermiculated, black and white; speculum, metallic green, preceded by a cinnamon band and edged inside and out by black feathers, the outer white tipped; a diagonal white bar on the shoulder; under parts, white; breast tinged with vinaceous and obscurely spotted with black; under tail-coverts black in the middle.

Adult female.—Above, dusky, varied with buff bars or edgings; head, buff, narrowly streaked with dusky; under parts and wings as in the male, but breast more buffy, with dusky centers to the feathers.

Transient and occasional winter resident. Rare on the coast, but, according to Mr. W. W. Justice, Jr., and others, it is seen consistently on Delaware Bay, though not in large numbers. Mr. George E. Hix[1] records thirteen in Palisades Park, December 2d, 1905, but Mr. Chapman regards it as rather uncommon in that vicinity. Mr. Hann reports it uncommon at Summit,[2] and Mr. Fowler[3] on the Upper Delaware, while Mr. Babson[4] says it is rare but regular about Princeton. Migrants occur in September and April.

140 Querquedula discors (Linnæus).

Blue-winged Teal.

Adult male.—Length, 14.50–16. Wing, 7–7.50. Head and neck plumbeous, dusky on crown and glossed with violet on the occiput; a large, curved white patch in front of the eye; upper part, dusky brown, with curved markings and edgings of buff; wing speculum, metallic green, preceded by white; coverts and inner scapulars, light blue; tertials, black, streaked with buff; under parts, white, strongly tinged with cinnamon, especially on the breast, and everywhere barred or mottled with dull black.

Adult female.—Dusky above; feathers edged with buff; wings as in male, but blue, less extensive; under parts similar but whiter, with less spotting; head, buff, streaked with dusky; throat, white.

Transient and rarely winter resident. Occurs about the same time and in the same numbers as the preceding, though perhaps rather more plentiful, and, like it, a fresh-water species.

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[1] Abst. Linn. Soc., N. Y., XVIII., p. 14.
[2] Wilson Bull., 1905, p. 119.
[3] Cassinia, 1903, p. 47.
[4] Birds of Princeton, p. 36.

142 Spatula clypeata (Linnæus).

Shoveller, Spoonbill Duck.

Adult male.—Length, 17–21. Wing, 9–10. Head and neck, metallic green; back, grayish-brown; rump, upper and under tail-coverts, black, glossed with green; breast, white; abdomen, chestnut; wing-coverts, light blue; speculum, metallic green, bordered in front with white.

Adult female.—Grayish-brown above; feathers with U-shaped marks of buff; head, light buffy, speckled with brown; crown, dusky; wings as in male, but duller; under parts, grayish-brown, tinged with vinaceous; sides barred with buff.

A rare transient or winter visitant. I have only the following recent records:

Anglesea; winter, 1888-9. Capt. John Taylor.[1]

Atlantic City; winter, 1888. I. N. DeHaven.[2]

Salem county; September 23d, 1904. Dr. W. R. Wharton.[3]

143 Dafila acuta (Linnæus).

Pintail, Sprigtail.

Adult male.—Length, 21–23. Wing, 9.60–10. Head brown, a dusky band on the crown and back of the neck, and a slight metallic gloss on each side of the occiput; upper parts and sides, gray, with fine black and white vermiculations; scapulars largely black, with buff or gray edgings; wings and tail, gray; a rather dull metallic speculum bordered in front by cinnamon, beind by black and white; center tail feathers, black, much lengthened; under parts, white, vermiculated with gray posteriorly; under tail-coverts, black.

Adult female.—Brownish-gray above; head and neck narrowly streaked with dusky; back with U-shaped marks of pale buff; under parts, dull white, somewhat mottled with dusky.

Common transient, and less common winter resident. Most plentiful on Delaware Bay, and frequent above Philadelphia. Occurs most abundantly in October and November.

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[1] O. and O., 1892, p. 43.

[2] Stone, Birds of E. Pa. and N. J., p. 37.

[3] Burns, Wilson Bull., 1905, p. 27.

144 Aix sponsa (Linnæus).

Wood Duck, Summer Duck.

PLATE 9.

Adult male.—Length, 19–20. Wing, 9–9.50. Above, black or brownish-black; feathers variously glossed and tipped with metallic blue and green; secondaries, tipped with white; outer edge of primaries toward their tips, silvery; head, crested metallic green and purple; a white stripe over the eye, another behind it; throat, white, running well up to the cheeks and back of the ear-coverts; breast, maroon-chestnut, spotted with triangular white spots; lower breast and abdomen, white; sides of body finely vermiculated with black and buff; under tail-coverts, dark brown, glossed with green, a maroon patch on each side at base of the tail, and a diagonal band of black and white across the shoulder.

Adult female.—Length, 17–19. Dark brown above, somewhat glossed with metallic colors, but very much duller than the male; head, gray, glossed with green on the crown; a white band all around the base of the bill, and a white spot before and behind the eye; throat, white, running up behind the ear-coverts; breast, dull brown, spotted with white and buff; abdomen, white.

Nest in a hollow tree, composed of grass, leaves, etc., lined with down; eggs, eight to fifteen, pale buffy white, 2 x 1.50.

Rare summer resident, and somewhat more plentiful transient. Formerly a common species, but rapidly reduced in numbers.

Mr. R. T. Morris[1] records it in winter on the Hackensack marshes, and it has been reported by others as a winter resident, but it is certainly rare at this season. Mr. Babson[2] says that four or five pairs breed along the Millstone River, near Princeton, where he observed them from February 28th to November 28th. Mr. W. L. Baily saw several at Spotswood November 23d, 1895. Two nests are mentioned by "B. B.," one on the Passaic River and the other in Ocean county.[3] Mr. W. B. Crispin writes me that he found a nest containing sixteen eggs April 25th, 1908, in a natural cavity of a Black Gum tree, about forty feet up, in a wood containing a colony of Great Blue Herons, in Salem county. Mr. Stewardson Brown tells me of a duck's nest that had been described to him, obviously of this species, found in a hollow tree near Blackwood, Camden county, in the spring of 1908. Alex. Wilson[4] describes a nest on the Tuckahoe River which he visited May 18th.

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[1] Forest and Stream, 1888, p. 485.
[2] Birds of Princeton, p. 37.
[3] O. and O., 1884, p. 3–4.
[4] Amer. Orn., VIII., p. 97.

146 Marila americana (Eyton).

Redhead.

Adult male.—Length, 17–21. Wing, 8.50–9.25. Head and upper neck, entirely bright chestnut red; lower neck, breast and shoulders, black; back and sides narrowly vermiculated with black and white; upper tail-coverts, dusky; under surface, white; crissum, dusky; wings, gray; greater coverts lighter, some of them edged with black.

Adult female.—Above, dull grayish-brown, brighter on head, neck and sides; breast, dusky; abdomen, white; brownish posteriorly; wings as in the male; chin, whitish.

Regular transient, and occasional in midwinter, but somewhat variable in its abundance. Rarely seen on the Delaware. Plentiful on Barnegat Bay (Justice), but not common at Cape May (Hand). Occurs from October to March.

147 Marila vallisneria (Wilson).

Canvas-back.

PLATE 10.

Adult male.—Length, 20–23. Wing, 8.75–9.25. Similar to the Redhead, but top of head, lores and chin, dusky; back and sides very much whiter, and under surface grayer, due to scattered dusky specks and wavy lines; bill very different; longer and sloping gradually from far up on the forehead.

Adult female.—Differs from female Redhead in lighter back; grayer under surface and darker crown. Bills differ as in males.

Transient, but not common. Shot mainly on Barnegat Bay. Mr. W. W. Justice, Jr., took one there on November 14th, 1906; another was shot October 25th, 1907, at Manahawkin,[1] and Dr. Braislin reports another January 25th, 1909.

I have no recent records for the Delaware River, although in Wilson's time it was frequent from Burlington to Eagle Point. He also describes a wonderful congregation of these birds which assembled on Great Egg Harbor Bay when a vessel loaded with wheat was wrecked. Two hundred and forty were killed in one day, though the species had scarcely been seen there before.

At Cape May Mr. Hand tells me that not more than two or three have been killed in his experience.

[1] Oldys, Auk, 1908, p. 80.

148 Marila marila (Linnæus).

Greater Scaup, Broadbill, Bluebill.

Adult male.—Length, 18–20. Wing, 8.25–9. Entire head, neck, breast and fore part of back, as well as rump, wings, upper and lower tail-coverts and tail, black; head glossed above, and on the sides with green; throat with purple; scapulars and middle of back vermiculated with black and white; a white wing speculum; abdomen, white, vermiculated posteriorly and faintly on the sides with black.

Adult female.—Above, dull black; finely speckled with gray on middle of back, becoming reddish-brown on back, sides of neck and breast; a white area on side of head next to bill, involving forehead and chin; abdomen, white, becoming brown on sides and dusky posteriorly; a white wing speculum.

Abundant transient and winter resident; the most plentiful species on Barnegat Bay, where it remains so long as the water is open, returning when the ice disappears. Occasional on the Delaware and at Princeton. This species is so generally confused with the next that it is difficult to determine which is the more plentiful. According to Mr. Chapman,[1] for the vicinity of New York; Mr. Scott,[2] for Long Beach, and Mr. Laurent,[3] for Five Mile Beach region, this species is the more abundant one. Occurs from October to April 15th, while Mr. Scott has seen flocks as late as May 1st.

149 Marila affinis (Eyton).

Lesser Scaup, Creek Broadbill.

Adult male.—Length, 15–16.50. Wing, 7.50–8.25. Similar to the preceding, but head glossed with purple on top, and with sides of the body strongly vermiculated with black and white like the back.

Adult female.—Differs only in size from female Greater Scaup.

Common transient or winter visitant. Occurs at the same time and in the same way as the preceding, though probably not so plentiful. Usually confused with it.

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[1] Birds Vicinity N. Y., p. 33.
[2] B. N. O. C., 1879, p. 226.
[3] O. and O., 1892, p. 44.

150 Marila collaris (Donovon).

Ring-necked Duck.

Adult male.—Length, 15.50–18. Wing, 8–8.50. Upper surface, black; head, neck and fore part of breast, black; the head and neck glossed with purple; chin, white; a narrow chestnut collar completely encircles the neck; wing speculum, gray; under part of body, white, finely vermiculated with gray on the sides and posterior part of the abdomen; under tail-coverts, black.

Adult female.—Above, dull black; breast and sides and back of neck, brown, with a rusty tint; sides of face and throat, white, mottled with gray; abdomen, white, brown on the sides and posteriorly.

Rare transient.

Wilson[1] records one shot on the Delaware March 10th, and Turnbull (1869) regarded them as frequent, which they are certainly not at the present time.

Mr. S. N. Rhoads tells me he has seen two or three on Newton Creek, Camden county.

151 Clangula clangula americana (Bonaparte).

Golden-eye, Whistler, Cubhead.

Adult male.—Length, 19–23. Wing, 9–9.25. Head and throat all around, black, glossed with green above, violet below; a white patch at the base of the bill; back, black; wings with scapulars, coverts and secondaries, largely white, streaked with black; neck and entire under parts, white; a few black streaks on the sides and flanks; tail, gray.

Adult female.—Length, 16.50. Wing, 8. Head and throat all around, brown; upper parts, gray; wing with a large white patch; beneath, white, with a gray breast band.

Young in first winter.—Similar to adult female, but with white neck, and more or less developed white spots at the base of the bill; scapulars with white centers, and feathers of head and back somewhat tipped with black.

Tolerably common transient or winter visitant on the bays along the coast. Rare or casual on the rivers. Occurs October 15th to April 1st.

One was killed at Princeton in January, 1817.[2]

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[1] Amer. Orn., VIII., p. 61.

[2] Green, Doughty's Cab. Nat. Hist., II., pp. 7–10.

153 Charitonetta albeola (Linnæus).

Bufflehead, Butterball.

Adult male.—Length, 12.25–13.50. Wing, 5.90–6. Back, black; head crested with metallic purple and green, with a large fan-shaped area from the eye to the nape, white; entire under parts and collar around the neck, white; feathers on sides narrowly edged with black; wing, black, with a large white shoulder patch, including some of the secondaries, some of the coverts edged with black; rump, grayish-white; tail, gray.

Adult female.—Dark grayish-brown above; a white area on each side of the face; throat, grayish-brown; rest of under parts, white; sides washed with gray; wing speculum, white; lesser coverts, gray.

Common transient and winter resident both along the coast and on Delaware Bay. November 1st to April 15th. A few each year on the Upper Delaware, and regular, and not uncommon at Princeton.[1]

154 Harelda hyemalis (Linnæus).

Old-squaw, Old-wife, Longtail, South-southerly.

Adult male in winter.—Length, 21–23. Wing, 8.50–9. Back and wings, black; scapulars, pale pearl-gray; head and neck all around, white; face, gray, and a large spot on the side of the neck, black, sometimes joined by a chestnut patch; whole breast, black; abdomen, white; tail, black in middle; outer feathers, white; center feathers, very much elongated; bill, black, with an orange band.

In spring.—Gray on front part of the head; rest of head and neck, black; scapulars, black, edged with brown.

Adult female in winter.—Length, 15–16. Back nearly all dusky; top of head, dusky; black on under parts restricted to a collar on the neck.

Common winter resident along the coast. October to the middle of April. Mr. W. W. Justice killed one at Beach Haven as late as June, in 1899; doubtless a barren bird. Casual on the Delaware above Philadelphia, and a rare migrant at Morristown (Thurber).

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[1] Babson, Birds of Princeton, p. 38.

155 Histrionicus histrionicus (Linnæus).

Harlequin Duck.

Adult male.—Length, 15–17. Wing, 7.50–8. General color, bluish-slate; browner on the abdomen, and purplish-black on the throat, neck and rump, and a similar line down the crown; sides, bright rusty; a metallic blue-black patch on the middle of the wing. Conspicuous white marks, bordered with black, occur as follows: A patch at base of bill; one on the ear-coverts, followed by a streak on the side of the neck; a circle completely round the neck, and a broad band across the shoulder; the scapulars are streaked with white and the purplish crown streak is bordered with white and chestnut.

Adult female and young in first winter.—Brown above, including neck, breast, sides and crissum; abdomen, dull white; sides of face in front of the eye, whitish, and a white patch on the ear-coverts.

Very rare winter visitant.

There are no records for the State except Turnbull's statement (1869) that it is "a very rare visitant from the North to the seashore."

156 Camptorhynchus labradorius (Gmelin).

Labrador Duck.

Adult male.—Length, 18–23. Wing, 8.75. Middle and lower back and tail, as well as a ring around the base of the neck, a stripe down the middle of the crown and entire abdomen, black; sides of head, breast, scapulars and wing-coverts, white.

Female.—Dull grayish-brown, with a white wing speculum.

Young in first autumn.—Similar to adult female, but with white showing faintly on throat and breast.

Extinct. Formerly a regular transient or winter visitant.

Audubon (1838) says: "Along the coast of New Jersey it occurs in greater or less numbers every year. It also at times enters the Delaware River and ascends that stream at least as far as Philadelphia." Turnbull (1869) says: "Rare; a few are seen every season," which seems to be the last word we have on its occurrence in New Jersey.

160 Somateria dresseri Sharpe.

Eider.

Adults.—Length, 20–26. Wing, 11–12. Besides the totally different bill, this species differs from the King Eider in having the top of the head black, divided posteriorly by the white of the neck; by having white scapulars, and by lacking the black V on the throat.

Adult female and young male are similar to corresponding plumages of the King Eider, but may easily be recognized by the shape of the bill and the feathering at its base.

Very rare winter visitant.

Turnbull (1869) says it "has been seen occasionally at Egg Harbor," and John Krider[1] records "four full-plumaged birds obtained at Barnegat in the month of February."

162 Somateria spectabilis (Linnæus).

King Eider.

Adult male.—Length, 23–24. Wing, 10.50–11.25. Head, blue-gray on top, pale green on sides of face, black next to the swollen base of the bill, and a black V on the throat; whole neck and breast, cream color; a white patch on each side of the rump, and on the wing-coverts; bill, back, abdomen, wings and tail black.

Adult female and young male in first winter.—Head and neck, grayish-buff, finely speckled with black; throat, unspotted; sides and breast, brownish, with black bars, or semi-circles on the feathers; middle of abdomen, plain grayish-brown; above more coarsely barred with black and brown.

Rare winter visitant. Wilson says it "is occasionally seen in winter as far South as the Capes of Delaware," and Turnbull (1869), that "it has been observed at Egg Harbor during severe winters, the specimens obtained being generally young birds." Krider[2] records two taken at Egg Harbor and one at Tuckerton.

The only recent record that I know of is one obtained by Mr. L. I. Smith,[3] December 4th, 1900, on the Delaware, below Philadelphia. It is of regular occurrence on Long Island.

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[1] Field Notes, p. 76.
[2] Field Notes, p. 76.
[3] Cassinia, 1901, p. 47.

163 Oidemia americana Swainson.

Scoter, Coot Duck.

Adult male.—Length, 17–21. Wing, 8.75–9.50. Entire plumage black; basal half of upper mandible and knob at base, yellow; rest of bill, black.

Adult female and young in first winter.—Dusky grayish-brown above; gray-brown below; bill, dull black.

Common winter resident and abundant transient off the shore beyond the breakers, occasionally driven into the bays or thoroughfares.

165 Oidemia deglandi Bonaparte.

White-winged Scoter.

Adult male.—Length, 20–23. Wing, 11–11.40. Black, more or less tinged with brown; a pure white speculum, and a white patch on the ear-coverts; sides of bill, orange-red.

Adult female.—Similar, but browner, with a white wing speculum, but no white on the head.

Common winter resident, occurring with the other species. It is difficult to ascertain their relative abundance.

166 Oidemia perspicillata (Linnæus).

Surf Scoter.

Adult male.—Length, 20–22. Wing, 9.50. Black, with a pure white triangular patch on the forehead, and a larger patch on the back of the neck; bill, red, with a large black spot on the swollen part on each side near the base.

Adult female.—General plumage, grayish-brown or dusky, indistinctly mottled with lighter below; a little white at the base of the bill; bill not swollen.

Young male in first winter.—Similar to the female, but whiter beneath, with two dull white patches on each side of the head.

Common winter resident with the other species of Scoter.

167 Erismatura jamaicensis (Gmelin).

Ruddy Duck, Sleepy Duck.

Adult male in spring.—Length, 14–16. Wing, 5.75–6. Above, bright chestnut; top of head, black, extending down the back of the neck in a point; sides of face and chin, white; entire neck, chestnut; under parts, silvery white, with gray bases to the feathers; wing and tail, brownish-black.

Female and male in winter.—Above, minutely mottled black and white, with a trace of chestnut here and there in male; entire neck, gray; top of head, dusky; face, white.

Young male in first autumn.—Similar below, but upper surface blackish, with coarser transverse bands of dull white and buff; head, brownish on top, and white face not clearly defined; a dusky stripe runs from the bill to the ear-coverts.

A tolerably common migrant, more plentiful on fresh water. Occurs at Princeton in small numbers, March to April and October 1st to November 20th.

169 Chen hyperborea (Pallas).

Snow Goose.

Adults.—Length, 23–28. Wing, 14.50–17. Similar in all plumages to the next; differs only in size.

Very rare transient or winter visitant.

A pair were obtained many years ago by Mr. John Cassin in the Philadelphia market, said to have been taken in the vicinity, and one was shot on the Delaware, above Chester, December, 1890, by Mr. W. V. Wilbank.[1]

169a Chen hyperborea nivalis (Forster).

Greater Snow Goose.

Adults.—Length, 30–38. Wing, 17.35–17.50. Pure white, except the black primaries, and a rusty stain often seen on the head; bill, dull red, with a white "nail;" feet, dull red.

Young in first winter.—Similar, but upper parts gray.

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[1] Stone, Birds of E. Pa. and N. J., p. 59.

Rare transient or winter visitant.

Gunners report them as casual along the coast. Formerly they were regularly abundant in Delaware Bay from the middle of February until March, and along both shores below Reedy Island,[1] and some are still to be found there, according to Mr. Hand, who tells me they come up regularly to Salem Cove to feed. Dr. W. L. Abbott took two on the bay March 5th, 1879, and January, 1882, and according to C. S. Wescott,[2] they were common in the latter season just below Bombay Hook, though usually only seen there in spring. Mr. Julian Burroughs[3] reports a large flock fogbound on the Hudson, off Gordon's Point, January, 1909.

Mr. Fowler[4] reports several at Edgewater Park, on the Delaware, in the winter of 1904-5.

169.1 Chen caerulescens (Linnæus).

Blue Goose.

Adults.—Length, 27–30. Wing, 15–17. Head and upper neck, white (or with rusty stains); upper surface, lower neck, breast and sides, plumbeous; abdomen and crissum, white; wing-coverts, light gray.

Young in first winter.—Similar, but head and neck plumbeous, except the chin.

Turnbull (1869) says: "In some seasons not uncommon on the Delaware and Atlantic coast." Normally a bird of the interior.

171a Anser albifrons gambeli (Hartlaub).

White-fronted Goose.

Adults.—Length, 27–30. Wing, 14.50–17.50. Grayish-brown above, as well as head, neck, breast and sides, with white around the base of the bill and tail tipped with white; abdomen, white, with black feathers scattered here and there irregularly.

Young in first winter.—Similar, but no black feathers below, and white at base of bill dusky.

Rare winter visitant.

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[1] Wilson, Amer. Orn., VIII., p. 76.

[2] Forest and Stream, January 5th, 1882, p. 447.

[3] Forest and Stream, January 23d, 1909, p. 133.

[4] Cassinia, 1905, p. 72.

Besides Turnbull's statement that it is rare, we have Dr. C. C. Abbott's (1868) record of one shot at Barnegat many years ago, and the statement of Mr. Chas. A. Voelker that one was shot on the Delaware in 1877, which was mounted by him.

172 Branta canadensis (Linnæus).

Canada Goose.

PLATE 11.

Adults.—Length, 35–43. Wing, 16–21. Above, blackish-brown, feathers with lighter edgings; under parts, gray; whole head and neck, black, except a broad white patch running from behind the eyes across the cheeks and throat; chin, black.

Common transient or winter visitant both on the coast and on Delaware Bay, and frequently seen in the migrations flying high overhead inland. October 1st to April 15th.

Occasionally alights during storms on ponds in the interior.

172a Branta canadensis hutchinsi (Richardson).

Hutchins's Goose.

Similar to the Canada Goose, but smaller. Length, 25–34. Wing, 14.75–17.75.

This is a western variety of the Canada Goose, and has been taken on Long Island.[1] "Homo," writing in Forest and Stream, March 2d, 1882, says that he shot one at Tuckerton, and that the bird is well known on Barnegat Bay by the name of Sedge Goose. I know of no other record for New Jersey.

173 Branta bernicla glaucogastra (Brehm).

Brant.

Adults.—Length, 24–30. Wing, 12.50–13.50. Brownish-gray above, feathers edged with whitish; pale gray below, becoming white on posterior parts and crissum; whole head, neck, upper breast and back, black, making a sharp contrast with the gray abdomen; a small patch of white streaks on each side of the neck.

[1] Chapman's Handbook, p. 122.

Abundant transient and winter resident; probably the most common game bird of Barnegat Bay. At Cape May Mr. Hand tells me it is only a straggler, the flights keeping well off shore. Occurs from October to May. Mr. Fowler reports it as occasional on the Delaware.

174 Branta nigricans (Lawrence).

Black Brant.

Adults.—Length, 22–29. Wing, 12.50–13.50. Similar to the Common Brant, but upper parts darker and more sooty; abdomen, dark sooty, scarcely distinguishable from the breast, but anal region and crissum, white; neck with larger white areas, forming a nearly complete collar.

Winter straggler from the West; rare.

Mr. G. N. Lawrence obtained the type specimen of this species at Egg Harbor, January, 1846, and later two more were obtained at the same place.[1] Mr. John Krider shot one at Barnegat and another at Beesley's Point,[2] and Mr. W. E. D. Scott[3] saw two taken by gunners, April 5th, 1877, at Long Beach.

180 Olor columbianus (Ord).

Whistling Swan.

Adults.—Length, 55. Wing, 21–22. Whole plumage, pure white; bill, lores and feet, black, sometimes with a small yellow spot on the lores.
Young in first winter, ashy gray; bill, flesh color; feet, grayish.

Rare transient.

One was shot on the Delaware River, below Philadelphia, December, 1890, by Mr. W. V. Wilbank,[4] and others have occasionally been taken in the same vicinity.

Mr. W. E. D. Scott saw a flock of nine passing over Barnegat Bay in November, 1876,[5] and Mr. H. W. Hand tells me that a flock of four passed over Cape May in the eighties, and one was shot. In the winter of 1908-1909 several were seen on Barnegat Bay, and one was shot at Atlantic City, in January.

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[1] Ann. Lyc., N. Y., IV., p. 171.
[2] Field Notes, p. 71.
[3] Bull. Nutt. Orn. Club, 1879, p. 226.
[4] Stone, Birds of E. Pa. and N. J., p. 60.
[5] Bull. Nutt. Orn. Club, 1879, p. 226.

Order HERODIONES.

Ibises and Herons.

Family IBIDIDÆ.

The Ibises.

Birds of the south, only occasionally straggling north to New Jersey. The Ibises are allied to the Herons, but with a curved bill, which is nearly round in cross-section.

a. Plumage bronze above; chestnut or dull brown below. Glossy Ibis, p. 97
aa. Plumage white. White Ibis, p. 97
aaa. Plumage brown above, white below. White Ibis (young), p. 97

184 Guara alba (Linnæus).

White Ibis.

Adults.—Length, 21.50–27.50. Wing, 10.50–11.50. White, the four outer primaries tipped with black; head with bare orange-red patches.
Young in first year grayish-brown on the back, head and neck streaked with dusky.

Formerly a very rare straggler from the south.

Audubon states, in 1835, that "a few individuals of this species have been procured in Pennsylvania and New Jersey." Turnbull "shot one at Great Egg Harbor in the summer of 1858," and there is a mounted specimen, possibly this same one, in the collection of the Philadelphia Academy, labeled New Jersey.

186 Plegadis autumnalis (Linnæus).

Glossy Ibis.

Adults.—Length, 22–25. Wing, 10.20–11.80. Above, glossy bronze, with green and purple reflections; head, neck and under parts, chestnut.
Young in first autumn.—Lower parts, dull brownish; head and neck streaked with white and dusky.

Very rare straggler.

Ord[1] states that Mr. Thomas Say, on May 7th, 1817, "received from Mr. Oram, of Great Egg Harbor, a fine specimen" of this Ibis. This specimen was figured by Bonaparte, and was possibly the type of his *Ibis Ordi*.

The only other record is one mentioned by Turnbull, that was shot in 1866 by Mr. John Krider, below Philadelphia. Krider's statement that "the bird is often shot in September on the marshes of the Delaware River; when shooting rail I have seen as many as four killed in a day," [2] can hardly be taken seriously.

Family ARDEIDÆ.

The Herons and Bitterns.

The members of this family are long-legged, long-necked, wading birds with a powerful bill and a well-developed hind toe, placed on a level with the others, so that the foot is used in grasping. The Herons are arboreal in their nesting habits, usually forming large communities or "rookeries," while the Bitterns live in pairs in swamps of reeds and cat-tails. They all feed upon frogs, small reptiles and fish, which they spear in the shallow water. When flying, their long legs are stretched out behind, while the head is drawn back on the shoulders. The nests and eggs of all our Herons are of the same character, differing only in size.

a. Plumage of upper parts slaty-blue, gray or bronze green.
  b. Size, large; wing, 18.50. — Great Blue Heron, p. 101
  bb. Size, medium; wing under 13.
    c. Crown bluish-slate or purplish.
      d. Neck similar. — Little Blue Heron, p. 105
      dd. Neck with white and rufous feathers. — Louisiana Heron, p. 105
    cc. Crown streaked with buff.
      d. Wings plain gray. — Black-crowned Night Heron, p. 107
      dd. Wings bronze-green. — Green Heron, p. 106
    ccc. Crown white. — Yellow-crowned Night Heron, p. 108

[1] Jour. Acad. Nat. Sci., Phila., I., p. 53.
[2] Field Notes, p. 60.

aa. Plumage pure white, or nearly so.
b. Size, large; wing, 14.25–16.75. EGRET, p. 103
bb. Size, medium; wing under 11.
c. Tips of primaries blue-gray. LITTLE BLUE HERON, p. 105
cc. Entire plumage white. SNOWY EGRET, p. 104
aaa. Plumage with buff and chestnut predominating, crown not streaked.
b. Size, very small; wing, 4.30–5.25. LEAST BITTERN, p. 100
bb. Size, medium; wing, 9.80–12. BITTERN, p. 99
aaaa. Plumage gray-brown, spotted above with white or buff, crown streaked.
b. Primaries rusty on the outer web.
BLACK-CROWNED NIGHT HERON (young), p. 107
bb. Primaries slate color, with no rufous tint.
YELLOW-CROWNED NIGHT HERON (young), p. 108

190 Botaurus lentiginosus (Montague).

Bittern, Stake-driver, Dunk-a-doo.

Adults.—Length, 24–34. Wing, 10–12. Above, brown, edged and mottled with buff; top of head, bluish-slate; a black stripe on each side of the neck; under parts, buff, broadly streaked with brown.
Young in first summer.—More buff than adults.
Nest on the ground in marshes; eggs, three to five, pale drab, 1.95 x 1.50.

The Bittern seems to be a regular but not abundant migrant along the coast and on the streams and marshes inland. Mr. Babson[1] states that it occurs near Princeton April 10th to May 5th and September 20th to October 20th, and these dates coincide closely with its occurrence near Philadelphia, though it has been seen as early as March 30th.[2] It seems to be especially common on the salt meadows in autumn. Specimens have been taken as late as November 2d, 1894, on the Delaware, at Holmesburg,[2] and November 19th, 1878, in Cape May county.[3]

It nests in various parts of the State, but is by no means as plentiful in summer as during the migrations. Thurber calls it a summer resident in Morris county, and Messrs. Haan and Callender found nests near Summit May 30th, 1894; May 30th, 1899, and June 30th, 1907, while Mr. P. B. Philipp states that at least one pair breed regularly at Newton, Sussex county, where he found young June 15th, 1908. On the Newark marshes Mr. C. G. Abbott found it nesting

[1] Birds of Princeton, p. 38.
[2] Fowler, Cassinia, 1903, p. 50.
[3] Coll. Acad. Nat. Sci., Phila.

June 17th, 1906.[1] Professor A. H. Phillips took a half-fledged bird at Princeton June 24th, 1899,[2] and Dr. C. C. Abbott tells me it breeds on his marshes below Trenton. In the southern part of the State Mr. H. W. Hand reports occasional nests near Cape May, on the bay side marshes, and Mr. W. B. Crispin found a nest near Salem, May 28th, 1904. Only about five, he tells me, have been found there in the last fifteen years.

The Bittern is a somewhat solitary inhabitant of the great coast and river marshes, where heavy growths of cat-tails, reeds and coarse grasses offer concealment. They are perhaps more frequently seen and shot during the Railbird season in the autumn, when gunners often flush these innocent, ungainly birds and then wantonly use them for targets. Their peculiar vocal performance in springtime, which has given the bird the names of "Thunder Pumper," "Stake Driver," etc., can be heard for long distances, and is well likened to the noise of an old pump or of pounding on a stake.

191 Ixobrychus exilis (Gmelin).

Least Bittern.

Adult male.—Length, 12–14. Wing, 4.30–5.25. Above, glossy black; back of neck, rufous; wings, mainly buff; under parts, buff, with a black spot on each side of the breast.

Adult female.—Similar, but browner, and under parts somewhat streaked.

Young in first winter.—Similar to adults, but with chestnut on the back, and somewhat streaked below.

Nest.—A platform of leaves and stems of grass and rushes supported among cat-tails and other coarse vegetation; eggs, three to five, pale bluish, 1.20 x .90.

The Least Bittern is a summer resident in various parts of the State, and is doubtless more plentiful than generally supposed, frequently escaping notice on account of its secretive habits. It arrives from April 24th to 27th, and the latest fall date that I have is September 3d. It seems to be mainly a fresh or brackish-water bird, and is usually rare on the seacoast. It nests in Morris county (Thurber), at Paterson (J. H. Clark), on the Newark marshes, May 30th to June 17th (Haan and

[1] Auk, 1907, pp. 1–11.

[2] Birds of Princeton, p. 38.

Callender).[1] Mr. Holmes states that it is a summer resident at Summit, but he has found no nests.[2] Alexander Wilson stated that it bred sparingly on the Delaware, and of recent years its nests have been found rather frequently at Camden (Wilde), Pensauken (Miller[3] and Hunt[4]), and at Pt. Richmond.[3] Mr. W. B. Crispin tells me that it is a regular breeder about Salem, and I have found it breeding rather commonly along the bay shore at Cape May. About Princeton Mr. Babson says it breeds commonly, and he found six nests during the first week of June, 1900.

When overtaken in the marshes the Least Bittern frequently remains perfectly still, grasping the stems of the reeds, and with neck extended and bill pointed skyward, sways back and forth with the reeds, so closely resembling them that he is easily passed by, and is not forced to expose himself by flight. When the danger is past he drops to the muddy ground and goes skulking away.

194 Ardea herodias Linnæus.

Great Blue Heron.

PLATE 12.

Adults.—Length, 42–50. Wing, 18–19.50. Above, blue-gray, the narrow scapulars largely white; primaries, shoulders, sides of crown and occipital feathers, greenish-black; sides of neck, rich vinaceous, white in front streaked with black; throat, sides of face and middle of crown, white; long breast plumes, gray and white; belly, greenish-black; thighs and edge of wings, light chestnut; crissum, white.

Young in first autumn.—Similar, but duller, and without plumes on back or breast; crown, black; under parts streaked with black, white and buff.

Nest.—A large bulky affair of sticks, usually in a tall tree in retired woodland; eggs, four or five; pale greenish-blue, 2.50 x 1.50.

Rather common transient throughout the State; most common during April and from August 1st to November. Occasional in winter, according to Turnbull, and one was seen December 9th at Audubon, N. J., by S. N. Rhoads.

In the southwestern counties the Great Blue Heron nests regularly. One heronry near Pennsgrove, Salem county, that I visited some years

[1] Also Abbott, Auk, 1907, p. 1.
[2] Wilson, Bulletin, 1905, p. 9.
[3] Fowler, Cassinia, 1903, p. 50.
[4] Cassinia, 1907, p. 48.

ago was in an oak woods, in pin oak trees, 100 to 115 feet high.[1] Mr. Crispin tells me that other nests are placed in white oaks and tulip poplars, and he knows of one colony which breeds in pines. Dr. Wm. E. Hughes[2] also describes a heronry of this species in pines near Pitman Grove.

In Alexander Wilson's time they bred in cedar swamps, one rookery which he mentions especially being located near the head of Tuckahoe River, Cape May county. I have not heard of them breeding in this section of late years, and I know of no heronry in the northern part of the State, although Thurber mentions the species as breeding in Morris county. Krider says that they bred on the beach strip of Cape May county, and Mr. Harry G. Parker[3] describes a small heronry on Seven Mile Beach in 1885, and Mr. Laurent[4] says a few bred on Five Mile Beach.[2] For some years past, however, they have not nested on the coast islands.

There is no more weird spot than one of the rookeries of the Great Blue Heron. They are located in some low, dark wood, flooded with water in the early spring and thick with a tangle of low shrubs and twining smilax, where tall pin oaks rear their tops above the other vegetation, their limbs loaded with the great, bulky nests, whitened by the excrement of the birds, which is also liberally scattered over the ground and shrubbery. Later it is mingled with broken egg shells, feathers and decayed fish, as the activity of the rookery increases with the hatching of the young.

There are sometimes a dozen nests in one tree, and all around on the branches sit the grotesque birds, craning their long necks and flying about overhead in great anxiety over the intrusion into their privacy.

It is a pity that the few remaining New Jersey rookeries cannot be left unmolested, but wanton gunners and collectors, who in the name of "science" gather eggs in a way which science never sanctioned and always condemned, will eventually exterminate them. Of what possible good to science is the gathering of dozens of egg shells of a bird whose breeding habits have been known and described for a hundred years, and whose eggs have been measured over and over again!

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[1] Abst. Proc. D. V. O. C., II., p. 20.
[2] Abst. Proc. D. V. O. C., III., pp. 5 and 11.
[3] O. and O., XI., 1886, p. 140.
[4] O. and O., 1892, p. 53.
Cf. also, W. B. Crispin, Oologist, 1905, p. 101, and E. J. Darlington, Oologist, 1903, p. 41.

196 Herodias egretta (Gmelin).

Egret, White Heron.

PLATE 13.

Adults.—Length, 37–41. Wing, 14.25–16.50. Pure white throughout with a bunch of long, straight "aigrette" plumes on the back; bill, yellow; legs and feet, black.

Young and adults after the nesting season lack the plumes.

Nest.—A platform of sticks in a tree; eggs, four, bluish-green, 2.25 x 1.45.

A not uncommon but irregular migrant from the south along the seacoast, and less frequently up the Delaware River, usually occurring from August 1st to the end of September.

Formerly this species bred in the southern part of the State. Wilson says: "Breeds in several of the extensive cedar swamps in the lower parts of New Jersey. * * * In the months of July and August the young make their first appearance in the meadows and marshes in parties of twenty or thirty together." He also adds that they come up the Delaware regularly to the meadows below Philadelphia.

Turnbull (1869) still includes it as a summer resident, but states that it is rather rare.

Scott[1] says it was common during the summer of 1879 at Beach Haven, and adds: "They breed in large numbers about forty miles south, near Townsend's Inlet." This remark, however, almost certainly refers to the Snowy Egret, as Mr. Scott was obviously not speaking from personal experience.

Dr. C. C. Abbott[2] describes a flock of these birds which visited the meadows near Trenton August 17th, 1876, in company with the Little Blue Herons, and similar occurrences, both here and on the coast, have occurred every few years.

Farther north Mr. Henry Hales writes me of two that visited Saddle River Pond five miles north of Ridgewood in July, 1902, remaining several weeks, and one was shot on Wading River August, 1905.

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[1] Bull. Nutt. Orn. Club, 1879.

[2] Amer. Nat., 1876, p. 473.

197 Egretta candidissima (Gmelin).

Snowy Egret, Snowy Heron.

Adults.—Length, 20–27. Wing, 8.25–10.50. White throughout; "aigrette" plumes upturned at the end; legs, black; feet, yellow; bill, black, yellowish at the base.

Young and non-breeding adults lack the plumes.

Nest as in the last; eggs, 1.80 x 1.25.

Formerly a regular summer resident along the southern coast, at least. For many years, however, it has not been seen in the State, even as a straggler.

Wilson (1812) says: "On the 19th of May I visited an extensive breeding place of the Snowy Heron among the red cedars of Sommer's Beach, on the coast of Cape May," and describes the heronry in some detail.

Turnbull (1869) regards it as not uncommon along the salt marshes of the sea coast from the beginning of April to October. In 1872 Mr. W. H. Werner states that he found them nesting in numbers where Ocean City is now located, eight to ten nests to a tree.[1] This was apparently the same rookery that Wilson referred to.

In 1886 Mr. H. G. Parker[2] reports that the colony on Seven Mile Beach still existed, the birds mingling with the Night Herons. In 1888[3] he records one pair nesting at this spot, saying: "They have been almost exterminated, though formerly very abundant, one ornithologist having recently shot seventy-three birds in one day."

This ends the record of the species, except for one mentioned by Thurber shot at New Vernon, Morris county, about 1881, by John Tunis. Many alleged Snowy Herons prove to be young Little Blue Herons in the white plumage.[4]

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[1] Cassinia, 1902, p. 21.

[2] O. and O., 1886, p. 140.

[3] O. and O., 1889, p. 2.

[4] C. C. Abbott, Amer. Nat. 1876, pp. 473–476, evidently refers to *A. caerulea*, although he records the species as *A. candidissima*. The record of a bird *seen* by R. F. Miller in July, 1904, and not published until 1907 (Auk, p. 436), is by no means conclusive.

199 Hydranassa tricolor ruficollis (Gosse).

Louisiana Heron.

Adults.—Length, 23–28. Wing, 8.35–10.80. Above, bluish-slate; back of neck, maroon, with some white feathers, especially on the occiput; long plumes at base of neck, maroon and slate; throat and under parts, white; "train" of hair-like feathers from the back, light drab.

Young in first autumn slate-colored above, white below, more or less rusty on throat and head; upper tail-coverts, white.

Very rare straggler from the south in former years. Turnbull says (1869): "This species has occasionally been obtained on the New Jersey coast." There is no more definite record.

200 Florida cærulea (Linnæus).

Little Blue Heron.

Adults.—Length, 20–29. Wing, 9–10.50. General color, uniform bluish-slate; head and neck, purplish-chestnut; legs and feet, black; bill, black; lores, blue.

Young in first summer and autumn, white, except the tips of the primaries, which are slate color; legs, feet and lores, greenish-yellow.

Nest like that of the Egret; eggs, 1.75 x 1.25.

A not uncommon but rather irregular migrant from the south in late July, August and early September. Most of these migrants are young birds in the white plumage, and as most persons are not aware that the Little Blue Heron is white during the first year of its life, they are constantly confused with the Snowy Heron and the Egret. I am inclined to think that most of the "White Herons" reported belong to this species. Most of the recent records given under the Egret refer also to this species, especially in the account by W. B. Evans.

I find no definite record of the nesting of this species in the State, except that of Wilson, who found them with the Snowy Herons, but only in small numbers, and Turnbull, who may be merely quoting from Wilson, his statement being "rare, but has been found breeding at Cape May." A. G. Van Aken refers casually to this species nesting with the Night Herons at New Brunswick April, 1882, but I think the Green Heron was the species intended.[1] Dr. C. C. Abbott assures me that one pair once nested near Trenton.

[1] O. and O., 1883, p. 46.

Adult birds in the blue plumage are very rare in New Jersey. There is one specimen in the Philadelphia Academy collection without detailed data, and several mentioned by Evans. In 1902 a remarkable flight of these two species occurred, which has been described by Wm. B. Evans,[1] and Mr. S. N. Rhoads saw a similar assemblage below Camden.[2]

Along the coast of Cape May Mr. Hand tells me that White Herons occur regularly in late summer, and at Tuckerton at least a few are reported nearly every year. Farther north in the State Mr. C. C. Owen[3] records two shot at Maplewood July 27th, 1897, and there have been a number of records in the vicinity of Point Pleasant.[4]

201 **Butorides virescens** (Linnæus).

Green Heron, Fly-up-the-creek, Poke.

Adults.—Length, 15.50–22.50. Wing, 6.50–8. Above, glossy green; back, more or less bluish-gray; wing-coverts edged with whitish; head and neck, for the most part, chestnut; top of head, glossy black, tinged with green; throat, pale buff, and a narrow stripe of the same down the fore neck; abdomen, gray, tinged with buff.

Young in first summer and autumn.—Similar, but no gray above, the neck and under parts streaked with black.

Nest a loose structure of sticks in a low tree; eggs, four to five, pale greenish-blue, 1.45 x 1.10.

Common summer resident throughout the State, nesting both singly and in colonies. Formerly nested along the coast islands, but now nearly exterminated there. Occurs April to October 5th.

Mr. W. W. Justice, Jr., saw one at Salem November 23d, 1898, which is our latest record.

This is the best-known and most universally distributed of our Herons, and no doubt its abundance is due to the fact that it has to a great extent abandoned the habit of nesting in communities. Had it

[1] Cassinia, 1902, p. 15.

[2] Abst. Proc. D. V. O. C., III., p. 12.

[3] Auk, 1898, p. 51.

[4] T. B. A., Forest and Stream, 1884, February 14th, p. 44; Stone, Birds of E. Pa. and N. J.; Evans, Cassinia, 1902, p. 15.

been unfortunate enough to possess desirable plumes or "aigrettes" it would have been exterminated long ago for millinery purposes like most of the foregoing species. Every secluded stream has its pair or two of "Pokes" or "Fly-Up-the-Creeks," and they nest contentedly in some small tree in the low, thick woodland, where they easily escape observation.

202 Nycticorax nycticorax nævius (Boddært).

Black-crowned Night Heron.

PLATE 14.

Adults.—Length, 23–26. Wing, 11–12.50. Top of head, back and scapulars, glossy greenish-black; rest of upper parts, gray; forehead, neck and under parts, grayish-white; several slender white plumes from the back of the head, six to eight inches long.

Young in first summer.—Light brown, streaked with white; below, streaked with grayish-brown and white; wings tinged with cinnamon.

Nest of coarse sticks; eggs, four to five, pale bluish-green, 2 x 1.40.

A rather common bird throughout the State, nesting usually in colonies in woodland, especially along the lower Delaware Valley, west of the Pine Barrens, and formerly on the coast islands, particularly Seven Mile Beach. They usually arrive during April, and are most common in August and September. Mr. C. J. Hunt finds them occasionally in midwinter at Pensauken,[1] and Mr. L. I. Smith took one on February 15th, 1902, on the Delaware, below Philadelphia, which was still in the brown plumage. They formerly associated with several other species in the heronries on the coast islands, and I have found them near Salem nesting with the Great Blue Herons.[2]

Mr. Thurber states that there were formerly several large heronries of this species near Morristown, and Mr. Hann says a few still nest near Summit, the remnant of a former large heronry.

Night Heron rookeries differ from those of the Great Blue Herons only in size and in the fact that they are usually in lower trees. The birds are nocturnal feeders, and roost during the daytime. In the evening, after dusk, and in the early hours of the morning, we can often hear them going overhead through the darkness, uttering now and then their hoarse "quak, quak."

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[1] Cassinia, 1907, p. 51.

[2] *Cf.* also, Shick Auk, 1890, p. 327; Coggins, Cassinia, 1902, p. 54.

203 Nycticorax violaceus (Linnæus).

Yellow-crowned Night Heron.

Adults.—Length, 22–28. Wing, 10.50–12.50. Above, bluish-gray, streaked with black on the scapulars; crown and ear-coverts, white, the former tinged with buff; sides of head and throat, black; under parts, bluish-gray; several slender white plumes from the back of the head; legs and feet, greenish; bill, black.

Young in first summer.—Similar to the young Black-crowned Night Heron, but wings bluish-gray, without rufous edgings.

A very rare straggler. I know of but one record—a full-plumaged bird obtained by Mr. Ware, at Woodbine, N. J., May 23d, 1892, which was mounted by Mr. C. A. Voelker and exhibited before the Delaware Valley Ornithological Club.[1] While he gives no definite record, Audubon says: "I am not aware of any having been seen farther [north] than New Jersey."

Order PALUDICOLÆ.

Rails and Cranes.

Family GRUIDÆ.

The Cranes.

Large Heron-like birds, but strictly terrestrial, with the hind toe reduced and elevated above the plane of the others. Birds of open marshy districts. Nest on the ground.

204 Grus americana (Linnæus).

Whooping Crane.

Adults.—Length, 50–54. Wing, 22–25. Plumage, white; primaries, black; top of head lores and sides of throat nearly naked, dark red with a few black hair-like feathers.

Young in first summer.—Plumage, dull buff; head entirely feathered.

[1] Stone, Birds of E. Pa. and N. J., p. 65.

Formerly a very rare straggler.

Wilson says (1812): "A few sometimes make their appearance in the marshes of Cape May in December, particularly on and near Egg Island [in Delaware Bay], where they are known by the name of 'Storks.' Some linger in these marshes all winter, setting out north about the time the ice breaks up." Turnbull (1869) writes: "Now very rare; while at Beesley's Point in 1857 I saw three off the inlet; they were very wary, and could not be approached; in Wilson's time it bred at Cape May." Peter Kalm saw Cranes migrating north in the spring while at Swedesboro in 1748-9, but whether Sand Hill Cranes, as stated by Turnbull (p. 49), or this species, I cannot say.

Family RALLIDÆ.

The Rails and Coots.

The Rails are birds of the more open marshes, where they run about rapidly, easily keeping concealed in the grass and seldom taking wing. They can swim if forced to do so, and fly in a rather labored fashion. The Coots are much more aquatic, and the Gallinules intermediate between the two. The downy young are black or dark slaty gray.

a. Bill, 2.40–2.50.
  b. Under parts cinnamon rufous, flanks barred black and white. King Rail, p. 110
  bb. Under parts grayish-buff, flanks barred gray and white. Clapper Rail, p. 110
aa. Bill, 1.50 or less.
  b. Plumage mainly bright blue; wing, 7. Purple Gallinule, p. 115
  bb. Plumage dark slaty-gray; wing, 6.50–8.50.
    c. Toes broadly lobed. Coot, p. 116
    cc. Toes not broadly lobed. Florida Gallinule, p. 115
  bbb. Plumage streaked or mottled, different above and below.
    c. No narrow silvery-white lines or spots above.
      d. Bill, 1.50. Virginia Rail, p. 111
      dd. Bill, .90. Corn Crake, p. 114
    cc. Fine, narrow silvery-white lines or spots above.
      d. White lines longitudinal; wing, 4.25. Sora, p. 112
      dd. White lines transverse, general color buff; wing, 3.25. Yellow Rail, p. 113
      ddd. White dots on back, general color black and slate; wing, 2.75. Black Rail, p. 113

208 Rallus elegans Audubon.

King Rail.

PLATE 15.

Adults.—Length, 17–19. Wing, 6–6.75. Above, dark olive, or nearly black with grayish edgings; wing-coverts, rufous chestnut; under parts, cinnamon rufous; throat, white; sides of body and abdomen, blackish, barred with white.

Nest of grass in fresh-water marshes; eggs, seven to twelve, buff, speckled with rusty brown and lilac, 1.60 x 1.20.

Not uncommon summer resident along the Delaware meadows, where it breeds. Dr. J. B. Brinton found a nest at Repaupo July 15th, 1892,[1] and Prof. A. H. Phillips[2] found an old bird with a brood near Princeton July 2d, 1899. Mr. H. H. Hann records a nest found in 1895 on the Passaic River, below Summit.[3] Occurs from April to the end of September. Apparently almost exclusively a fresh-water bird. The only coast record with which I am acquainted is one given by Mr. P. Laurent for Five Mile Beach.[4]

Wilson figured this bird for the Clapper Rail, following the current opinion of gunners that it was a very old example of that species.

Audubon subsequently described it as distinct, his type specimen being shot near Camden in July, 1832.

This bird is the fresh-water representative of the Clapper Rail, differing from it in its deeper, richer coloration.

211 Rallus crepitans Gmelin.

Clapper Rail, Mud-hen.

Adults.—Length, 13.50–15.50. Wing, 5.40–6.30. Upper parts, dull olive, margined with gray; wing-coverts, grayish-cinnamon; under parts, pale grayish-buff; throat, whitish; sides and abdomen, gray, barred with white.

Nest in salt marshes, made of grass; eggs, eight to twelve, buffy-white, spotted with rusty brown and gray, 1.70 x 1.20.

Abundant summer resident on the salt marshes of the coast and up Delaware Bay as far as Greenwich, which, according to Mr. S. N.

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[1] Abst. Proc. D. V. O. C., II., p. 5.
[2] Birds of Princeton, p. 40.
[3] Wilson Bulletin, 1905, p. 120.
[4] O. and O., 1892, p. 53.

Rhoads, is the northern limit,[1] while Mr. Crispin tells me they do not reach Salem.

They occur from the middle of March to the middle of November, and are occasionally found in midwinter at Atlantic City (DeHaven) and at Five Mile Beach (Laurent).[2] Full sets of eggs may be found from May 25th to June 10th and later, when the first nest has been destroyed.

Wilson, writing in 1812, states that "about June 1st the people of the neighborhood go off on the marshes *an egging,* as it is called. So abundant are the nests of this species, and so dextrous some persons at finding them, that 100 dozen of eggs have been collected by one man in a day," and "B. B." records purchasing over seven hundred in market for exchange specimens.[3] Fortunately this practice, which threatened the extinction of the bird, is now unlawful.

Through the summer they are inconspicuous, searching for food along the bottoms of the little sloughs and thoroughfares, and building their nests on the higher parts of the marshes among the taller grass. At sunset they may be heard uttering their peculiar cackle, and can often be induced to show themselves by imitating the call. They run rat-like through the grass, dodging this way and that with great agility when pursued.

In the autumn they are shot in large numbers, and when the high autumnal tides flood the meadows, as they sometimes do, and the Mudhens are forced to swim or to gather on the islands that here and there stand above the water, the slaughter is a disgrace to those who call themselves sportsmen.

212 **Rallus virginianus** Linnæus.

Virginia Rail.

Adults.—Length, 8.25–10.50. Wing, 4–4.25. Colors almost exactly like the King Rail. Differs in its smaller size.

Young in first autumn.—Middle of abdomen, white, with scattered black feathers all over the under surface.

Nest and eggs.—Similar to those of the King Rail, except in size, 1.25 x .90.

Rather common summer resident, occurring April 15th to October 1st. Breeds all along the Delaware meadows from the fresh or

[1] Cassinia, 1901, p. 51.
[2] O. and O., 1892, p. 53.
[3] O. and O., 1883, pp. 39–40.

semi-brackish marshes of Cape May to Trenton; also at Elizabeth,[1] the Newark marshes,[2] near Summit,[3] and at Princeton.[4] Mr. S. N. Rhoads also found it breeding in the Wallkill valley, Sussex county, June 11th, 1909.

Dr. C. C. Abbott[5] records two birds killed at Trenton in January, 1869, and several were seen and shot by Dr. Huey on Dennis Creek, Cape May county, December 30th, 1895. Along the coast it occurs in migrations, and has been shot at Atlantic City as late as November 6th, 1891 (I. N. DeHaven). In all respects a miniature of the King Rail.

214 Porzana carolina (Linnæus).

Sora, Carolina Rail.

PLATE 16.

Adults.—Length, 7.85–9.75. Wing, 4.25–4.30. Forehead, fore part of face, center of crown, chin and throat, black; upper parts, brownish-olive, streaked with black, and with narrow white tips and edgings; sides of head and neck and entire breast, plumbeous; sides of body and flanks, broadly barred black and white; middle of abdomen, white; crissum, buff.

Young in first autumn.—Similar above, but sides of face and the breast brownish; throat and abdomen, white; sides, duller.

Nest of grass in fresh-water marshes; eggs, eight to fifteen, buff, spotted with rusty brown and lavender, 1.25 x .90.

A common migrant along the Delaware meadows and in marshes in the northeastern portion of the State. April 1st to May 10th and August 20th to October 25th. At Greenwich, Salem county, it occasionally winters, according to Mr. S. N. Rhoads.[6] Mr. Chapman says it is a rare summer resident near New York City,[7] and Mr. Scott took a half-fledged young in July, 1880, near Princeton.[8] Dr. W. E. Hughes has found nests on the Delaware marshes below Philadelphia, and both Wilson and Audubon mention young birds taken in the same vicinity.

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[1] H. T. Haines, O. and O., 1883, p. 7.
[2] J. P. Callender.
[3] H. H. Hann, Wilson Bulletin, 1905, p. 120.
[4] Babson, Birds of Princeton, p. 40.
[5] Amer. Nat., IV., p. 549.
[6] Cassinia, 1901, p. 51.
[7] Birds Vicinity N. Y. City, p. 144.
[8] Babson, Birds of Princeton, p. 40.

The Sora is best known in New Jersey as a transient game bird, and in the autumn both it and the Reedbird are killed in large numbers on the marshes bordering the Delaware and other large rivers, which are then covered with the tall stalks of the wild rice. The gunners are poled about in old flatboats, and the feeble-winged Railbirds fall an easy prey to their guns.

215 Coturnicops noveboracensis (Gmelin).

Yellow Rail.

Adults.—Length, 6–7.50. Wing, 3–3.50. Head, neck and breast, bright ochraceous, slightly edged with darker; top of head, lores and entire back, blackish; head narrowly, back and wings broadly streaked with ochraceous; neck, back and wings narrowly barred with white; secondaries, white; middle of abdomen, white; sides barred with black and white; crissum, brown.

Rather rare transient, most frequently seen in fall, when quite a number are doubtless shot by gunners and not recorded.

I have the following records:

Palmyra; W. L. Baily; October 13th, 1886.[1]

Princeton; A. H. Phillips; April 10th, 1895.[2]

Hackensack; George Richards; September 30th, 1893.[3]

Salem; Mr. McKee; October 24th, 1908.[4]

Dr. Trudeau told Audubon that they reached Salem by the end of April, and that a few remained there for the summer. The latter statement has never been confirmed.

216 Creciscus jamaicensis (Gmelin).

Black Rail.

Adults.—Length, 5–6. Wing, 2.50–3.20. Above, brown, darker and blacker on the head and lower parts; lower back and wings spotted with white; sides of head and under parts, deep plumbeous; lower abdomen and crissum spotted and barred with white.

Nest on the ground in marshy places, made of grass and rushes; eggs, creamy-white, speckled with reddish-brown, 1.03 x .75.

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[1] Stone, Birds of E. Pa. and N. J., p. 67.

[2] Babson, Birds of Princeton, p. 41.

[3] Forest and Stream, September 20th, 1893, p. 336.

[4] Harlow, Auk, 1909, p. 190.

Rare transient, but formerly, and possibly still, a summer resident at several localities in the State. The elusive habits of the smaller Rails render it difficult to judge of their abundance.

The first specimen from this neighborhood was probably one in Peale's museum, taken about 1806 in the vicinity of Philadelphia.[1] Dr. Trudeau told Audubon that they nested in great numbers at Salem, but so far as I know, no one has verified this statement.

In 1844 and 1845 three nests of this species were found near Beesley's Point, Cape May county,[2] and there is no reason why the bird should not be found breeding in the same vicinity to-day.

In May, 1872, Mr. C. L. Mather found a nest with eight eggs on the marshes along Rancocas Creek, about five miles from Mt. Holly, and shot the bird,[3] and in 1885 a set of eggs now in Mrs. Drown's collection was collected near Tuckerton.

The only records of the capture of specimens beside one taken with the Beesley's Point nests are as follows:

Salem; Wm. Patterson.[4]

Mouth of Big Timber Creek, near Camden; September 22d, 1887; "W. J. Sherratt" [=W. J. Rogers].[5]

Also one flushed by Prof. A. H. Phillips at Princeton.[6]

217 Crex crex (Linnæus).

Corn Crake.

Adults.—Length, 10–10.50. Wing, 5.70–6. Above, light grayish-brown, striped with black; wings, mainly light rufous; breast and sides, pale grayish-brown, the latter barred with white; throat and abdomen, white.

Accidental straggler from Europe, probably by way of Greenland. Only two instances of its occurrence in the State are known. One shot by Mr. Wm. Patterson at Salem in the fall of 1854,[7] and another shot by Mr. H. Walker Hand at Dennisville, Cape May county, November 11th, 1905.[8] Both specimens are preserved in the Philadelphia Academy.

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[1] Audubon's Orn. Biog.
[2] Stone, Auk, 1900, p. 172.
[3] A. R. Justice, Atlantic Slope Nat., I., No. 2, p. 11, 1903.
[4] Stone, Birds of E. Pa. and N. J., p. 67.
[5] O. and O., 1887, p. 206.
[6] Babson, Birds of Princeton, p. 41.
[7] Cassin, Proc. Acad. Nat. Sci., Phila., VII., January, 1855, p. 265.
[8] Cassinia, 1905, p. 75.

218 Ionornis martinica (Linnæus).

Purple Gallinule.

Adults.—Length, 13–14. Wing, 7–7.50. Head, neck and under parts, bluish-purple; back and wings, bright green, shading into verditer blue on the neck and coverts; crissum, white; bill, red, with a yellow tip.

Very rare straggler from the south.

Cassin states[1] that the Purple Gallinule occurs occasionally north to New Jersey, and Turnbull records one shot by John Krider at League Island, in the Delaware. Dr. Abbott (1868) also states that one was taken at Trenton November 2d, 1864. More recent records are as follows:

Cape May; May, 1892. C. F. Gardner (C. A. Voelker).[2]
Tuckerton; prior to 1894. Jillson Brothers (several).[2]
Longport; May 23d, 1898. W. H. Werner.
Ventnor; May, 1902. W. H. Werner.
Cape May; May 10th, 1907. H. W. Hand.
Beach Haven; May 10th, 1907. C. W. Beck.[3]

219 Gallinula galeata (Lichtenstein).

Florida Gallinule.

PLATE 17.

Adults.—Length, 12–14.50. Wing, 6.85–7.25. Similar in coloration to the Coot, but the gray-tint is bluer; the back is browner, and there are a few white stripes on the flanks; bill, red, tipped with yellow; shield, red.

Nest in wet swamps, supported among cat-tails and rushes; eggs, eight to twelve, 1.75 x 1.20.

Regular summer resident in the Newark marshes and the marshes of the Delaware.

This bird is an excellent example of the secretiveness of birds of this family. It was unknown as a New Jersey bird to the older ornithologists, and while Turnbull calls it a summer visitant, he calls it

[1] Birds of N. A., p. 753.
[2] Stone, Birds of E. Pa. and N. J.
[3] Coll. Acad. Nat. Sci., Phila.

very rare, and makes no suggestion of its breeding. Dr. Abbott says it is only occasionally met with, though he records a specimen shot at Trenton in July, 1862. Other specimens have been taken, especially by gunners in the autumn, but not until 1904 had anyone found a nest in this vicinity. It was discovered nesting commonly in deep cat-tail swamps on the Delaware, at Philadelphia, in that year by Mr. Richard F. Miller,[1] and in 1906 on the Newark marshes by Messrs. C. G. Abbott, Hann and Callender.[2] Eggs were found May 28th to July 1st.

Thurber mentions the species as a rare summer visitor to Morris county, and Babson[3] says it was once seen in April at Princeton.

221 Fulica americana Gmelin.

Coot, Crow Duck.

PLATE 17.

Adults.—Length, 16. Wing, 7.75–8.75. Head and neck, dark sooty gray; rest of plumage, lighter plumbeous; a tinge of brown on the back; tips of secondaries and outer edge of wing, white; middle of abdomen, tipped with white, and under tail-coverts, mainly white; bill, white; shield, brown.

Young in first winter.—Head, lighter gray; plumage of under surface more or less tipped with white.

Nest in swamps on floating piles of vegetation or among rushes; eggs, six to sixteen, gray, speckled with black, 1.80 x 1.30.

Common migrant along the coast and on the bay; occasionally inland. March 30th to May 3d, September 1st to October 29th.

Thurber[4] records it as breeding near Morristown, and Mr. C. G. Abbott[5] records a nest on the Newark marshes, found May 30th, 1907.

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[1] Cassinia, 1905, p. 24.
[2] Auk, 1907, p. 1.
[3] Birds of Princeton, p. 41.
[4] True Democratic Banner, November 10th, 1887.
[5] Auk, 1907, p. 436.

Order LIMICOLÆ.

Shore Birds.

Family PHALAROPIDÆ.

The Phalaropes.

These birds are essentially "swimming Sandpipers" with curiously lobed feet, somewhat like those of the Coot.

They are peculiar also in the fact that the female is more brightly plumaged than the male, while the latter attends for the most part to the incubation of the eggs. Wilson's Phalarope nests in interior North America, the others in the far north.

a. Wing, 5.25–5.50.	Red Phalarope, p. 117
aa. Wing less than 5.25.	
b. Bill, .85.	Northern Phalarope, p. 118
bb. Bill, 1.25 or over.	Wilson's Phalarope, p. 119

222 Phalaropus fulicarius (Linnæus).

Red Phalarope.

Adult in spring.—Length, 7.50–8.50. Wing, 5.25–5.50. Above, streaked broadly with black and buff; top of head, dull black (streaked with buff in the male); wing, grayish, with a white wing band; sides of head, white; entire under parts, cinnamon, with a purplish cast.

Adult in autumn.—Above, pearl-gray; wings and tail, gray or dusky; ear-coverts, dusky; rest of plumage, white.

Young in first autumn.—Dusky above, edged with buff; white below, suffused with brown on breast and throat.

Pelagic, occurring well off shore during migrations, but rarely coming in to the coast or up the rivers.

Ord states that the specimen figured by Wilson was taken near Philadelphia in the latter part of May, 1812. There were three in the flock. Doubtless they were driven into the Delaware River by a storm. Audubon (1835) says that stragglers at times reach New Jersey. Dr. Abbott (1868) records one shot on the Hackensack June 27th, 1863, and Turnbull (1869) says a few are obtained every season,

and that one was shot September, 1868, at the mouth of Big Timber Creek, by Mr. B. A. Hoopes. Mr. F. M. Chapman saw a number of specimens of this and the following species from a vessel well off the Delaware coast on May 9th, 1897,[1] and Mr. W. E. D. Scott saw five Phalaropes, species not determined, five miles off Long Beach May 20th, 1877.[2] The only recent records that I have from New Jersey are one killed at Ocean City May 6th, 1907 (W. H. Werner), and another obtained by Mr. H. W. Hand at Cape May, May 3d, 1909.

Dr. B. H. Warren mentions two in the possession of C. D. Wood, shot in New Jersey.[3]

223 Lobipes lobatus (Linnæus).

Northern Phalarope.

Adults in spring.—Length, 7–8. Wing, 4–4.40. Above, dusky, streaked on the back with buff, a narrow white wing bar; lower parts, white; breast, more or less dusky (chestnut in female); a patch of rusty chestnut on the side of the neck.

Adults in autumn.—Gray above, white beneath; forehead and line over the eye, white.

Young in first autumn.—Dusky above, with buff edgings; forehead and lower parts, white; breast somewhat clouded with dusky.

Pelagic, occurring off shore regularly during migrations, and occasionally coming in to the coast or up the rivers. It is more frequently seen than either of the other species in New Jersey, occurring in May and September.

Mr. Chapman observed them off the coast of Delaware May 9th, 1897.[4]

Specimens have been obtained in the State as follows:

One shot by Dr. C. C. Abbott at the mouth of Rancocas Creek prior to 1868; one obtained May, 1892, on Delaware Bay, and mounted by C. A. Voelker;[5] two obtained on Peck's Beach (Ocean City) May 22d and May 23d, 1894, by L. F. Bowers and F. L. Burns;[6] one shot by A. P. Willets September 13th, 1895, at Anchoring Island, near

[1] Abst. Proc. Linn. Soc., N. Y., X., p. 2.
[2] Bull. Nutt. Orn. Club, 1879, p. 224.
[3] Birds of Penna., p. 77.
[4] Abst. Proc. Linn. Soc., N. Y., X., p. 2.
[5] Stone, Birds of E. Pa. and N. J., p. 69.
[6] Auk, 1895, p. 189.

Tuckerton;[1] one shot by D. N. McCadden at Stone Harbor September 4th, 1903;[2] one procured by H. Bergen May 22d, 1896, at Cranbury, near Princeton,[3] one in the Turnbull collection labeled N. J. without date.

224 Steganopus tricolor Vieillot.

Wilson's Phalarope.

Adults in spring.—Length, 8.50–10. Wing, 4.75–5.25. Above, blue-gray, with several longitudinal bands of chestnut; head, pearl-gray, becoming white on the nape; a broad black band down each side of the neck from the bill to the sides of the breast, which are chestnut; lower parts, white; lower throat tinged with cinnamon.

Adults in autumn.—Dull gray above, white below.

Young in first autumn.—Upper parts, dusky, edged with buff; below, white; throat tinged with cinnamon.

A rare straggler from the interior of North America.

Ord records a specimen of Wilson's Phalarope shot near Philadelphia May 7th, 1818, and prepared for Peale's museum.[4] Audubon was informed that they bred in New Jersey by a person who showed him the skins of two specimens procured in July near Cape May, and assured him that he shot them near their nest, and that they had four eggs. There is no other evidence that the species ever bred on the Atlantic coast and it would seem probable that his informant was not reliable.

Dr. Abbott (1868) records two captures—one at Deal Beach, the other at Atlantic City.

More recently there are two records—a specimen shot at Ocean City, May 19th, 1898, by Mr. Gilbert H. Moore,[5] and two shot from a small flock at Cape May, May 4th, 1909, one of which was shown to me by Mr. H. Walker Hand.

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[1] Abst. Proc. D. V. O. C., II., p. 18.
[2] Cassinia, 1903, p. 76.
[3] Babson, Birds of Princeton, p. 41.
[4] Ord's Reprint of Wilson, X., p. 234.
[5] Coll. D. V. O. C. *Cf.* Auk, 1898, p. 268.

Family RECURVIROSTRIDÆ.

THE AVOCETS AND STILTS.

Long-legged Snipe, which habitually wade, and can swim when necessity arises.

a. Bill decidedly upturned at the tip, hind toe present.
AVOCET, p. 120

aa Bill very slightly or not at all upturned, hind toe absent.
BLACK-NECKED STILT, p. 121

225 Recurvirostra americana Gmelin.

Avocet.

Adults in spring and summer.—Length, 15.50–18.50. Wing, 8.50–9. Head, neck and breast, pale cinnamon; scapulars and wings (except secondaries and tips of greater coverts), dull black; rest of plumage, white. *In winter* the head and breast are white, tinged with gray.

Young in first autumn.—Similar to winter adults, but with some buff or rusty mottling above.

Nest a depression in marshy ground; eggs, three to four, pale olive or buff, spotted with chocolate-brown, 1.90 x 1.30.

A very rare straggler from the south.

In 1812 Wilson wrote that he found these birds and the Stilts "associated together on the salt marshes of New Jersey [Egg Harbor] on the 20th of May. They were then breeding. Individuals of this species were few in respect to the other." Audubon says: "In May, 1829, I saw three of these birds at Great Egg Harbor, but found no nests, although those of the Long-legged Avocet of Wilson [*i. e.*, the Stilt] were common." From these statements it would seem that the Avocet was never a common species in the State.

In 1869 Turnbull describes it as "rather rare, appearing late in April and leaving in October." Since then we have only four records for the State: One shot by Mr. I. N. DeHaven,[1] last of August, 1886, near Tuckerton; one seen by Mr. W. E. D. Scott,[2] Long Beach, May 20th, 1877; one seen by Mr. I. W. Griscom,[3] middle of September,

[1] Stone, Birds of E. Pa. and N. J., p. 70.
[2] Bull. Nutt. Orn. Club, 1879, p. 224.
[3] Forest and Stream, January 23d, 1909.

1908, at Avalon, and another shot by John Fonda at Barnegat, May 31st, 1880.[1] John Krider states that it formerly nested on Egg Island, in Delaware Bay.[2] There is a specimen in the Philadelphia Academy collection, taken at Beesley's Point by Samuel Ashmead, without date.

226 Himantopus mexicanus (Müller).

Black-necked Stilt, Lawyer.

Adult male.—Length, 13.50–15.50. Wing, 8.50–9. Wings, upper back, back of head and neck, glossy greenish-black; rest of plumage, including forehead and ring around the eye, white; legs, bright red.

Female.—Similar, but back browner.

Young in first autumn.—Similar, but edged above with buff.

Nest a depression in the ground; eggs, three to four, buff spotted with chocolate-brown, 1.80 x 1.25.

Very rare straggler from the south.

Wilson and Audubon found the Stilt a common summer resident at Egg Harbor, breeding on the salt meadows in 1812 and 1829, respectively, and Turnbull and Krider state that they found it nesting on Egg Island, Delaware Bay [evidently prior to 1869], but it was rather scarce.

A letter from Wm. M. Baird to his brother, Spencer F. Baird, dated Cape Island, July 16th, 1843, states that they were present there at that time, and a few days later, on July 21st, at Cape May Court House, he secured a specimen.[3]

The only recent record I have is one shot at Stone Harbor April 27th, 1894, by C. A. Voelker.[4]

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[1] Braislin, Auk, 1905, p. 78.
[2] Forty Years' Notes, p. 62.
[3] Baird, Cassin & Lawrence, Birds of N. A., p. 704.
[4] Stone, Birds of E. Pa. and N. J., p. 152.

Family SCOLOPACIDÆ.

THE SNIPE AND SANDPIPERS.

Long-billed, usually long-legged, birds which secure their food by probing in the soft mud or sand of the sea shores. The great majority of the species nest in the far north, and are familiar to us as coast migrants, occurring in mixed flocks or flights in spring, late summer and autumn. They have been much shot for game, with the result that they have been greatly reduced in numbers, and some species threatened with extermination.

a. Bill, 2.15–6.25.
b. Curved downward at tip.
c. Bill, 5–8. LONG-BILLED CURLEW, p. 140
cc. Bill, 3–4. HUDSONIAN CURLEW, p. 141
ccc. Bill, 2.25–2.50. ESKIMO CURLEW, p. 142
bb. Slightly upturned at tip.
c. Tail barred black and rusty. MARBLED GODWIT, p. 133
cc. Tail black with white band at base. HUDSONIAN GODWIT, p. 134
bbb. Bill, straight.
c. Under parts uniform rufous. WOODCOCK, p. 124
cc. Under parts rufous, barred with black. EUROPEAN WOODCOCK, p. 123
ccc. Under parts rufous, spotted with black. DOWITCHER, p. 126
cccc. Under parts white, more or less barred or streaked on breast and flanks.
d. Wing over 7.
e. Base of primaries white. WILLET, p. 137
ee. Base of primaries not white. GREATER YELLOW-LEGS, p. 135
dd. Wing less than 6.
e. Tail black, with a subterminal rusty bar. WILSON'S SNIPE, p. 125
ee. Tail transversely banded, black and white. DOWITCHER (autumn), p. 126
aa. Bill, .75–1.50.
b. Throat and breast rufous or dull buff.
c. Wing, 6.50 or over. KNOT, p. 127
cc. Wing, 5.50 or less.
d. Under side of primaries finely vermiculated, black and white. BUFF-BREASTED SANDPIPER, p. 139
dd. Under side of primaries uniform. CURLEW SANDPIPER, p. 131
bb. Entire under parts barred black and white (streaked on the throat) and tinged with rusty. STILT SANDPIPER, p. 127
bbb. Entire under parts white with round black spots. SPOTTED SANDPIPER, p. 140
bbbb. Entire under parts black, except crissum. BLACK-BELLIED PLOVER, p. 143

*b*⁵. Breast black, throat and belly white. TURNSTONE, p. 147
*b*⁶. Belly black, throat and breast white with black streaks. RED-BACKED SANDPIPER, p. 130
*b*⁷. Head, back and breast dusky, belly and chin white. PURPLE SANDPIPER, p. 128
*b*⁸. Belly white, breast white or buff, often more or less streaked with dusky.
c. Breast tinged with buff, in contrast to white throat and belly, and streaked with black.
d. Wing, 6 or more. UPLAND PLOVER, p. 138
dd. Wing under 5. PECTORAL SANDPIPER, p. 128
cc. No buff-tint on the breast.
d. Wing, 6 or more.
e. Tail feathers gray. KNOT (autumn), p. 127
ee. Tail feathers barred black and white.
f. Bill, 1.35. YELLOW-LEGS, p. 136
ff. Bill, 1.15. BLACK-BELLIED PLOVER (autumn), p. 143
dd. Wing, 4.50–5.
e. Bill, 1 or less.
f. Rump entirely white.
ff. Rump dusky in the middle. BAIRD'S SANDPIPER, p. 130
ee. Bill, 1.25–1.50. WHITE-RUMPED SANDPIPER, p. 129
f. Tail feathers banded black and white. SOLITARY SANDPIPER, p. 136
ff. Tail feathers plain gray. RED-BACKED SANDPIPER (autumn), p. 130
fff. Tail feathers gray, with white centers. STILT SANDPIPER (autumn), p. 127
ddd. Wing, 4 or less.
e. Two toes slightly webbed at base. SEMIPALMATED SANDPIPER, p. 132
ee. No webs at base of toes.
f. Bill, 1. SPOTTED SANDPIPER (young), p. 140
ff. Bill, .60. LEAST SANDPIPER, p. 130

227 Scolopax rusticola Linnæus.

European Woodcock.

Adults.—Length, 13.50. Wing, 8. Similar in general appearance to the Woodcock on the upper surface, but buff below, transversely barred with dusky, and wing quills and tail feathers with rusty bars on the outer webs.

An accidental straggler from Europe.

A specimen was obtained in Washington Market, New York, December 6th, 1859, said to have been killed at Shrewsbury, N. J.,[1] and Dr. B. H. Warren records another obtained from a game dealer in Philadelphia September, 1889, said to have been shot in New Jersey.

[1] Lawrence, Ann. Lyc. Nat. Hist., VIII., 1866, p. 223.

228 Philohela minor (Gmelin).

Woodcock.

PLATE 18.

Adults.—Length, 10.50–11.75. Wing, 4.80–5.70. Upper parts barred irregularly with black and rusty, with pale gray spots down the back; back of head with three broad black transverse bands bounded and separated by narrow fulvous bands; under parts, uniform cinnamon, a dusky bar from the eye to the bill, and another across the ear-coverts; wing quills, dull brownish-gray; tail feathers, black, tipped with gray above and white beneath.

Nest in dry leaves in the woods; eggs, four, buff, spotted with reddish-brown, 1.50 x 1.15.

Summer resident, but most abundant in migrations, and occasional in winter. Much less abundant than formerly.

Mr. H. W. Hand tells me that the spring flight is particularly noticeable at Cape May, beginning from February 28th to March 9th. In autumn the migration occurs during October and November. About South Orange Mr. W. A. Babson states that the birds seem to be increasing with the abandonment of summer shooting. The flight occurs there in fall, from October 15th to November 28th. At Princeton he found them staying until December, and at Haddonfield Mr. S. N. Rhoads found one on January 1st, 1881. Mr. Hand also tells me that they occasionally occur in winter at Cape May.

Mr. W. B. Crispin found a nest at Pennsgrove May 20th, 1903; Mr. A. H. Jillson took a set of eggs at Tuckerton May 13th, 1884, and Mr. Hann reports a few nesting at Summit, but it is becoming a rare breeder in the State.

In the old days the abundance of the Woodcock may be judged from the statement of a writer in Doughty's Cabinet of Natural History, who says that in 1825, on the Cohansey River, three men, in two hours, killed upwards of forty on a very small tract of ground.

The Woodcock is a grotesque-looking bird, with his large round eyes perched high up and far back on the head. He is a bird of low-wooded country, where areas of soft mud afford him good feeding grounds, and where we can see countless borings as evidence of his presence.

The unfortunate and absurd practice of shooting Woodcock in July

has done much to reduce the numbers of this splendid bird until it has been classed among the vanishing game birds.[1]

During the mating season the male Woodcock at dusk performs a remarkable aerial performance, mounting in a spiral, his rapidly moving wings making a continuous whistle, and then back to earth preparatory to another ascent.

230 Gallinago delicata (Ord).

Wilson's Snipe, English Snipe.

PLATE 19.

Adults.—Length, 10–12. Wing, 5–5.30. Above, black, striped and mottled with buff and rusty; edge of outer primary and tips of greater coverts, white; throat and abdomen, white; breast, buff, mottled with dusky; sides broadly barred with black; under tail-coverts, buff, barred with black; tail, rufous, barred with black and tipped with white; middle feathers, largely black. A dusky line from the eye to the bill and another across the ear-coverts.

Nest a hollow on the ground; eggs, three to four, olive or buffy-brown, heavily mottled with darker brown, 1.50 x 1.10.

A regular transient, occurring in spring, March 20th to May 10th; sometimes as early as March 3d; in autumn, from October 1st to December 1st, and casually all winter. Dr. C. C. Abbott has seen it in winter at Trenton, and Mr. Scott has found it in springy places where the ground remains unfrozen. Mr. S. N. Rhoads found one at Haddonfield in midwinter about 1875. W. B. Evans[2] saw one at Moorestown December 25th, 1902, and Mr. W. A. Babson[3] shot one January 4th, 1900, at Princeton.

In the vicinity of New York Mr. Chapman[4] says that a few pass the winter.

Wounded birds have been observed as late as June by Mr. Scott at Princeton, and Turnbull says some stay during summer. Mr. Herrick[5] reports that such birds have nested on several occasions near Chatham, and Dr. Abbott (1868) states that some breed at Trenton, but gives no specific instance.

The only positive record with which I am acquainted is a nest found a few years ago at Newfoundland by Mr. A. R. Dugmore.

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[1] *Cf.* A. K. Fisher, Two Vanishing Game Birds, U. S. Dept. Agriculture.
[2] Bird Lore, 1903, p. 17.
[3] Birds of Princeton, p. 42.
[4] Birds Vicinity of N. Y., p. 39.
[5] Forest and Stream, 1879, p. 165.

231 Macrorhamphus griseus (Gmelin).

Dowitcher, Brownback.

Adults in spring.—Length, 10–11. Wings, 5.25–5.75. Upper parts, dusky, blacker on the back, edged and barred or streaked with rusty or buff, rump and tail barred black and white; under parts, including sides of head and neck, cinnamon rufous, spotted or barred (on sides) with black; center of abdomen, white.

In autumn.—Throat, middle of abdomen and line from bill through the eye, white; rest of plumage, ashy-gray, except the rump and tail, which are barred black and white.

Young in first autumn.—Upper parts varied with dusky and edged with brown; chest tinged with brown and indistinctly speckled with dusky.

Regular transient, not uncommon on the coast; May 6th to 20th and July 20th to October 1st.

Mr. W. E. D. Scott[1] found them as early as July 6th at Long Beach, and Dr. W. L. Abbott got one in Cape May county July 18th, 1878, while others, apparently on the northward migration, were taken as late as June 10th, 1879, and May 22d, 1882.[2]

232 Macrorhamphus scolopaceus (Say).

Long-billed Dowitcher.

Very similar to the Dowitcher of which it is the western representative. Distinguished by its longer bill, which averages 2.70 instead of 2.30; its generally larger size, length, 11–12.50 against 10–11, and the deeper coloration of the lower parts in spring and summer.

While I do not know of any actual New Jersey specimen of this species, it undoubtedly occurs as a rare visitant with the other Dowitcher. Krider mentions it, and it has been secured on Long Island.

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[1] Bull. Nutt. Orn. Club, 1879.

[2] Colln. Acad. Nat. Sci., Phila.

233 Micropalama himantopus (Bonaparte).

Stilt Sandpiper.

Adults in spring.—Length, 7.50–9.25. Wings, 5–5.25. Black above, streaked or mottled and edged with buff and rusty; rump and upper tail-coverts barred black and white; a cinnamon rufous patch from the eye over the ear-coverts and another from over the eyes around the back of the neck; under parts, pale cinnamon, streaked on the neck and barred elsewhere with black.

In autumn.—Tail-coverts and rump barred black and white; rest of upper parts, ashy-gray; lower parts, white, streaked with gray on the chest, sides of neck and under tail-coverts.

Young in first autumn.—Upper tail-coverts white, back edged with buff; under parts, dull white, tinged with buff and obscurely streaked with gray.

Rare transient on the coast, and according to Dr. C. C. Abbott, single specimens have been killed on the Delaware at Trenton.

The type specimen was shot by Bonaparte[1] from a flock at Long Branch, in the middle of July, 1826.

Turnbull (1869) states that it occurs in May and again in August, but gives no definite records. One New Jersey specimen is in his collection from Brigantine Beach.

In 1879, between July 15th and September 15th, Dr. Jonathan Dwight[2] secured ten specimens at Squan Beach; Mr. W. L. Baily got two from a flock of four at Cape May August 11th, 1897, and on August 20th, 1897, got another from a flock of three on Two Mile Beach.

234 Tringa canutus Linnæus.

Knot, Grayback, Robin-snipe.

PLATE 20.

Adults in spring.—Length, 10–11. Wing, 6.50. Above, pale gray, irregularly streaked and mottled with black; rump and upper tail-coverts barred black and white; under parts, pale cinnamon rufous; flanks, under tail-coverts (and sometimes belly), white, with some dusky streaks.

In autumn.—Ashy-gray above, except rump and upper tail-coverts, which are barred black and white; below, white with dusky streaks on foreneck, chest and sides.

Young in first autumn.—Similar, but feathers of back narrowly edged with black and tipped with whitish; under parts, white, finely mottled or streaked with dusky on breast and sides.

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[1] Ann. Lyc., N. Y., II., p. 157.

[2] Bull. Nutt. Orn. Club, 1879, p. 63.

Transient; much less common than formerly. Occurs during the latter half of May, and again from the middle of July to October. Dr. W. L. Abbott took one in Cape May county as late as June 3d in 1879.

235 Arquatella maritima (Brünnich).

Purple Sandpiper.

Winter adults.—Length, 8–9.50. Wing, 5–5.40. Above, sooty black, edges of greater coverts and some secondaries entirely white; under parts, gray, passing into white on the abdomen.

Young in first winter edged with buff above.

A very rare winter visitant.

Turnbull (1869) says it is very rarely seen so far south, and one specimen from Egg Harbor is contained in his collection without date.[1] Dr. Abbott (1868) states that a specimen was found dead near the Absecon lighthouse, and Mr. A. P. Willets shot one at Beach Haven October 31st, 1896.[1] Krider[2] states that he only obtained two specimens during his long experience. These are the only definite New Jersey records, although Chapman,[3] referring probably to Long Island, says it is a rare but regular winter resident.

239 Pisobia maculata (Vieillot).

Pectoral Sandpiper, Grass-snipe.

Adults.—Length, 8–9.50. Wing, 5–5.50. Head and neck streaked pale buff and dusky; back and rump, blackish, the former edged with buff; throat and entire abdomen, white; neck and breast, buff, streaked with dusky.

Young in first autumn.—Similar, but more rusty above.

Transient along the coast; common in the vicinity of New York, according to Chapman, but apparently less abundant along the New Jersey beaches. It occurs in April and from August to October, always more plentiful in fall. It was common in the time of Bonaparte and Turnbull. Mr. Scott found it scarce at Long Beach in

[1] Colln. Acad. Nat. Sci., Phila.
[2] Field Notes, p. 64.
[3] Birds Vicinity N. Y., p. 39.

1877,[1] and Mr. Laurent makes the same statement for Five Mile Beach. Dr. W. L. Abbott[2] obtained specimens on the beaches of Cape May county October 4th, 1879, and September 14th, 1880, and Mr. W. L. Baily[3] found a number at Holly Beach in September, 1895.

Mr. Baily reports a specimen shot on the Delaware River March 26th, 1886, and Dr. C. C. Abbott[4] and Dr. Thomas[5] state that they are occasional on the upper part of the river. Near Princeton they also occur occasionally, and on August 29th, 1895, Dr. Farr found them abundant at Cranbury Millpond.[6]

240 Pisobia fuscicollis (Vieillot).

White-rumped Sandpiper.

Adults.—Length, 6.75–8. Wing, 4.90–5. Plumage similar to *Ereunetes pusillus*, but the rump pure white, and streaks on breast and sides of head rather finer and narrower. Distinguished also by its larger size, being intermediate between the Semipalmated and Red-backed Sandpipers.

Transient, and apparently rather scarce on the New Jersey coast, although Mr. Chapman says it is not uncommon in the vicinity of New York City.[7]

Bonaparte was apparently the first to find this species in the State, as he shot specimens on the coast prior to 1832, and stated that they were rather common there in autumn. Turnbull (1869) says that it is frequent, and Mr. Scott[8] found it common at Long Beach in 1877. Mr. Laurent,[9] however, regards it as rare at Five Mile Beach, and I have found no specimens in collections made on the New Jersey coast in recent years. It is quite likely that it is confused with the Least and Semipalmated Sandpipers, with which it associates, and which it so closely resembles. These birds are so common that they would be passed by and not collected, and this probably accounts for the scarcity of the present species in local collections.

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[1] Bull. Nutt. Orn. Club, 1879, p. 225.
[2] Colln. Acad. Nat. Sci., Phila.
[3] Abst. Proc. D. V. O. C., II., p. 18.
[4] Birds of N. J., 1868.
[5] Birds of Bucks county, Pa.
[6] Babson, Birds of Princeton, p. 42.
[7] Birds Vicinity N. Y., p. 39.
[8] Bull. Nutt. Orn. Club, 1879.
[9] O. and O., 1892, p. 53.

241 Pisobia bairdi (Coues).

Baird's Sandpiper.

Length, 7–7.50. Wing, 4.60–4.80. Closely resembles the preceding in size and general appearance, but the rump is broadly dusky in the middle and the breast strongly tinged with buff.

Rare transient in the autumn. There is but one record, a male shot at Stone Harbor September 5th, 1898, by Mr. David McCadden, and now in the collection of the Philadelphia Academy. It was presented by Mr. H. W. Fowler.

242 Pisobia minutilla (Vieillot).

Least Sandpiper, Peep, Oxeye.

Adults in spring.—Length, 5–6.50. Wing, 3.50–3.75. Above, black, irregularly marked and streaked with rusty and buff; rump and upper tail-coverts, dull black; under parts, white, except foreneck and chest, which are tinged with brown and streaked with dusky.

In autumn.—Plain brownish-gray above; throat and abdomen, white; breast, ashy-gray, obscurely streaked.

Very common transient, occurring during May, and again July 15th to September 15th. At Long Beach, in 1877, Mr. Scott[1] found them as early as July 7th.

They occur up the Delaware occasionally, usually in August, and at various places inland. Mr. Babson[2] found them at Princeton in May, and from July 25th to September 10th. Audubon found them on the Raritan River July 29th, 1832, and Wilson records them on the Schuylkill, at Philadelphia, in August.

243a Pelidna alpina sakhalina (Vieillot).

Red-backed Sandpiper, Black-breast, Dunlin.

Adults in spring.—Length, 7.60–8.75. Wing, 4.60–4.95. Head, neck and breast (except chin), dull white, streaked with black; top of head strongly tinged with rusty; back, black, bordered with rusty; wings, dull brownish,

[1] Bull. Nutt. Orn. Club, 1879.

[2] Birds of Princeton.

middle coverts tipped with white; belly, black; flanks and posterior part of abdomen and crissum, white, latter with narrow black streaks.

In autumn.—Above, plain ashy-gray; throat and abdomen, white; breast, ashy-gray.

Young in first autumn.—Similar, feathers of upper parts edged with rusty or buff; under parts, white; neck streaked, breast and belly spotted with black.

Very common transient, occurring in May, and from September 1st to November 1st. Mr. Scott[1] found them at Long Beach as early as April 17th, 1877, and Dr. W. L. Abbott found them plentiful in Cape May county April 18th, 1878, and at Five Mile Beach Mr. Laurent[2] states that they remain all winter, while Turnbull (1869) also states that a few winter, and Dr. W. L. Abbott obtained two specimens in Cape May county November 29th, 1878.

Occasional on the Delaware, but apparently rare, according to Drs. C. C. Abbott and Thomas.[3] I have no recent record.

244 Erolia ferruginea (Brünnich).

Curlew Sandpiper.

Adults in spring.—Length, 7–9. Wing, 4.80–5.20. Head, neck and lower parts, cinnamon rufous; upper parts, blackish and rusty.

In autumn.—Above, plain brownish-gray, with indistinct shaft streaks, stripe over the eye, rump and under parts, white; grayish on chest.

Young in first autumn.—Similar, but back dusky, streaked with buff, and breast tinged with buff.

A very rare straggler from the old world.

Audubon says "two were shot at Great Egg Harbor in the spring of 1829."

Turnbull states that Wilson must also have met with it, as in his portfolio of drawings he found a figure of the species in autumnal plumage.

Dr. C. C. Abbott (1868) says that specimens have been taken at Tuckerton and Cape May.

The only other record of its occurrence in the State is one in the collection of Mr. John Lewis Childs,[4] shot on Long Beach July 29th, 1904.

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[1] Bull. Nutt. Orn. Club, 1879.
[2] O. and O., 1892, p. 53.
[3] Birds of Bucks county, Pa.
[4] Auk, 1904, p. 485, and Warbler, 1904, p. 71.

246 Ereunetes pusillus (Linnæus).

Semipalmated Sandpiper, Peep, Oxeye.

PLATE 21.

Adults in spring.—Length, 5.25–6.50. Wing, 3.65–4. Upper parts, black, feathers edged with buff and strongly streaked with rusty; rump, plain dusky; under parts, dull white, breast and sides spotted or streaked with dusky.

In autumn.—Above, plain ashy-gray; below, unspotted.

Young in first autumn.—Similar to spring adults, but duller, and breast washed with buff and unstreaked.

Abundant transient, occurring in May, and from July 10th to October 1st.

Occurs on the Delaware occasionally and at suitable places inland.

This species is probably our most abundant migrant Sandpiper, but it associates so intimately with the Least Sandpiper and resembles it so closely that it is practically impossible to distinguish them in life, so that statements made about one apply equally to the other.

247 Ereunetes mauri Cabanis.

Western Sandpiper.

Closely related to the Semipalmated Sandpiper of which it is the western representative, and from which it may be told by its much longer bill—.85 to .95 instead of .68 to .75—and by the greater amount of rusty edgings to the feathers of the upper parts.

The Western variety of the preceding, with which it occurs, more or less regularly, in autumn.

A specimen was obtained by Dr. W. L. Abbott in Cape May county September 14th, 1880, and another by Mr. I. N. DeHaven at Atlantic City May 17th, 1892. Mr. W. L. Baily[1] found it quite as plentiful as the Eastern form on Two Mile Beach September 1st to 15th, 1895, and secured twenty specimens.

[1] Auk, 1896, p. 174.

248 Calidris leucophæa (Pallas).

Sanderling.

Adults in late spring.—Length, 7–8.75. Wing, 4.70–5. Above, black, edged with rusty; throat and sides of neck and head, rusty, spotted with black; rest of under parts, white.

In early spring.—Head and back with more or less black and rusty feathers appearing among the gray.

In autumn and winter.—Pale gray above, under parts entirely white.

Young in first autumn.—Gray above, mottled with black and white; below, white, washed with buff on the breast.

Very common transient, occurring in spring, April 18th to June 1st, and July 15th to October 15th.

Dr. W. L. Abbott obtained a specimen as late as June 13th, 1879, in Cape May county, which is in the full rusty breeding plumage. Mr. W. L. Baily obtained adults at Cape May August 4th, which were just beginning to molt into the winter dress.

Turnbull (1869) says that many Sanderlings remain on the coast all winter, and Mr. H. W. Hand tells me that a few still winter at Cape May, while Dr. W. L. Abbott took one on Five Mile Beach on November 28th, 1878, and Mr. Scott[1] found six or seven the last week of December at Long Beach. Dr. C. C. Abbott (1868) states that Sanderlings have been killed at Trenton and New Brunswick, but I have no recent record inland. This species is more strictly a beach bird than many of the others, and is seldom found on the bays or marshes.

249 Limosa fedoa (Linnæus).

Marbled Godwit, Marlin.

Adults.—Length, 16.50–20.50. Wing, 8.50–9. Plumage a mixture of cinnamon-buff and dull black; head and neck streaked, back and tail barred; throat, white; rest of under parts, buff, barred with black.

Young in first autumn.—Similar, but under parts plain buff.

Rare fall migrant, formerly more plentiful, occurring in May and September, according to Turnbull (1869). Wilson (1812) says: "They are found along the salt marshes in May and for some time in

[1] Bull. Nutt. Orn. Club, 1879.

June, also in October and November, but they are much less numerous than the Short-billed [*i. e.*, Hudsonian] Curlews." Krider[1] regarded them as plentiful in autumn. Mr. Scott[2] met with but three at Long Beach in 1877, an adult in May and two young late in July. His observations, however, ceased September 1st. Dr. W. L. Abbott only obtained two during many trips to Cape May county. These were on September 14th, 1880.

Dr. Warren[3] states that a few have been taken in Philadelphia and Delaware counties, presumably along the river, but I have nothing definite on this subject.

251 Limosa haemastica (Linnæus).

Hudsonian Godwit, Ring-tailed Marlin.

Adults.—Length, 14–16. Wing, 8.10–8.60. Black above, head and neck streaked with buff or light chestnut; rump, base and tip of tail, pure white; lower parts, darker chestnut, barred with dusky.

Young in first autumn.—Brownish-gray above, head, neck and under parts, very pale gray or whitish; rump and tail as in adult.

Most specimens seen from New Jersey are molting from one plumage to the other and are variously mottled.

Rare and irregular fall migrant. It was first mentioned from New Jersey by J. Doughty,[4] who describes and figures a specimen taken May, 1828, at Cape May, by Titian R. Peale. Another specimen in the Philadelphia Academy was procured by Mr. A. Galbraith in the Philadelphia market in 1855, which had been secured in New Jersey. Turnbull (1869) states that it is rather scarce, arriving late in September.

One was shot by C. D. Wood,[5] September, 1878, on the Schuylkill, below Philadelphia, and another, labeled "Delaware River, Dr. Gambel," is in the Philadelphia Academy collection.

About 1885 Mr. I. N. DeHaven informs me that they occurred at Atlantic City with the Willet in autumn, two or three in each flock. Since then I have seen a specimen obtained at Cape May September, 1900, by Mr. Henry Hazlehurst, and two were shot at Anglesea by Mr. H. W. Wenzel August 26th, 1901, one of which is in the collection of the Philadelphia Academy.

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[1] Field Notes, p. 67.
[2] Bull. Nutt. Orn. Club, 1879.
[3] Birds of Pa., p. 88.
[4] Cabinet of Nat. Hist., II., p. 158.
[5] Trotter, Bull. Nutt. Orn. Club, 1879, p. 275.

254 **Totanus melanoleucus** (Gmelin).

Greater Yellow-legs, Tell-tale.

Adults in spring.—Length, 12.15–15. Wing, 7.50–7.75. Above, blackish, mottled all over with white or grayish; rump, white, with dusky tips to some of the feathers; tail, barred black and white; under parts, white; neck and chest streaked, sides barred with dusky.

Adults and young in autumn.—Similar, but gray above spotted with white, spots below much less distinct.

Common transient, occurring April 20th to May 16th, and again July 15th to October, some lingering until November. Mr. H. W. Hand tells me that the main flight at Cape May is in October. The latest records we have are one shot by Dr. W. L. Abbott at Five Mile Beach November 7th, 1877, and another shot by Mr. Ernest Schluter at League Island, on the Delaware, November 9th, 1897.[1]

I saw two at the mouth of Pensauken Creek, on the Delaware, May 30th, 1897, and Mr. W. L. Whitaker took one on Tacony Creek, Pa., May 11th, 1895. Mr. Babson[2] also finds it occasionally at Princeton in August and September, and it has been seen at other points inland.

An idea seems to have been prevalent that the Greater Yellow-legs bred in New Jersey. Wilson and Audubon were so informed by natives at Egg Harbor, and Turnbull gives the species as a summer bird, without comment. Dr. C. C. Abbott[3] includes both species of Yellow-legs and the Solitary Sandpiper as breeders in Mercer county, but, like many other statements made in the same paper, there is a lack of definite data and no confirmation. Mr. T. Morgan[4] records a nest at Somerville, N. J., June 9th, 1883, but his detailed description shows that it belonged to some other species.

As a matter of fact, the bird has never been found nesting within many hundred miles of New Jersey.

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[1] Fowler, Cassinia, 1903, p. 53.
[2] Birds of Princeton, p. 43.
[3] Amer. Nat., IV., p. 548.
[4] O. and O., VIII., p. 67.

255 Totanus flavipes (Gmelin).

Yellow-legs, Summer Yellow-legs.

Adults.—Length, 9.50–11. Wing, 6.25–6.65. Plumage similar to the Greater Yellow-legs at all seasons; easily distinguished by the difference in size.

Transient; very rare in spring, but usually common in autumn. Occurs from July to October 15th.

Mr. Scott[1] saw none in spring at Long Beach in 1877, but they arrived as early as July 9th, and were common through August. Messrs. H. W. Hand and Philip Laurent[2] state that it is not so common on the Cape May beaches as the preceding.

It is said to occur occasionally on the Delaware, although I have no recent record. At Princeton a few appear the latter part of every summer, and August 14th, 1875, Mr. Scott secured five specimens.

In Wilson's time it was very plentiful in autumn, and large numbers were brought to market. On September 5th he "shot several dozens on the meadows of Schuylkill, below Philadelphia." The alleged records of nesting in the State are without foundation, as stated under the preceding species.

256 Helodromas solitarius (Wilson).

Solitary Sandpiper.

Adults in spring.—Length, 7.50–8.50. Wing, 5–5.40. Upper parts, dull blackish-brown, with an olive tint; head streaked and back spotted with white, sides of rump and all the tail feathers but the middle pair, broadly barred with black and white; under parts, pure white, breast narrowly streaked and sides barred with dusky.

Adults and young in autumn.—Similar, but duller and grayer above, with less spotting.

Rather common transient. Occurs on fresh-water streams, meadows and ponds, but is rare on the seacoast. In spring it is with us from April 25th to May 30th, and in autumn from September 15th to October 20th. Mr. H. W. Fowler has taken specimens as early as July, on the Delaware, at Holmesburg, Pa.

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[1] Bull. Nutt. Orn. Club, 1879, p. 225.

[2] O. and O., 1892, p. 53.

Notwithstanding Dr. Abbott's statement[1] that this species "breeds in the State as regularly as *Spizella socialis*," the Chipping Sparrow, no one else has found the nest, and none of the alleged nests or eggs seems to have been preserved. There is no doubt, I think, but that this species nests on the Pocono Mountains, in Pennsylvania, and there is, of course, a chance of its breeding in the mountainous counties of Northwestern New Jersey, but hardly in Mercer county.

This is almost the only migrant Sandpiper that one is likely to see regularly away from the coast. We come upon them singly or in parties of two or three about some pond or meadow. In general appearance they recall the Spotted Sandpiper, but may be easily recognized by their larger size.

258 Catoptrophorus semipalmatus (Gmelin).

Willet.

Adults in spring.—Length, 15–17. Wing, 7.50–9. Gray above, tinged with brown, streaked and barred with dusky; rump and a large patch on the wing feathers, white; middle tail feathers, barred; others white, mottled with gray; under parts white, washed with gray on the neck and buff on the sides; neck and chest streaked and sides barred with dusky.

Adults and young in autumn.—Pale gray above, white beneath, rump and wings as in spring.

Rare fall migrant. Formerly common along the coast, April 20th to May 15th and July 17th to September 15th; and casual up Delaware Bay. Also bred extensively.

Wilson (1812) says: "This is one of the most noisy and noted birds that inhabit our salt marshes in summer. * * * It breeds in great numbers, and has eggs May 20th." Turnbull (1869) records it as still common from the middle of April to October.

At Long Beach Scott[2] (1879) writes: "Said to have been formerly one of the most abundant breeding species, but is fast becoming rare by the inroads of gunners and egg-hunters. I took a male April 6th, 1877, and saw no others until May. On the 17th of July they began coming from the north, and were very common for a time." Mr. S. N. Rhoads secured one September 1st, 1881, on the same beach, and another October, 1882, and Mr. W. L. Baily got one at Atlantic City in the fall of 1884; saw a number at Five Mile Beach July 23d to August 17th, 1896; three at Cape May in August, 1897; one at Five

[1] Amer. Nat., IV., p. 548.
[2] Bull. Nutt. Orn. Club, 1879, p. 225.

Mile Beach May 21st, 1898, and one at Beach Haven August 9th, 1902. Mr. C. S. Shick[1] states that the Willets were still breeding on the salt marshes adjoining Seven Mile Beach in 1889, when he took two sets of eggs on Gull Island.

Dr. W. L. Abbott, on Five Mile Beach, took only two of these birds May 15th, 1877, and September 14th, 1880, and Mr. Laurent,[2] writing of the same spot in 1892, says a few are seen in spring and fall.

On the bay side of the Cape May peninsula they also bred, and a nest is recorded by Mr. C. E. Bellows,[3] which was taken May 19th, 1884, near the Warner House, on Delaware Bay.

The last capture of the bird that we know of in this vicinity was one obtained by Mr. W. R. Wharton, October 8th, 1904, near Salem, and presented to Mr. F. L. Burns.[4]

260 Machetes pugnax (Linnæus).

Ruff.

Adult male.—Length, 10–12.50. Wing, 6.40. Mottled above, black, buff and gray, long pendant feathers forming a cape and extended "ruff;" these are varied—glossy black, white, buff or mottled, differing in each individual; under parts, white, varied with black.

Female without "cape" or "ruff;" upper parts barred, black, white and buff; below, white.

Young dusky above, edged with buff; breast, buff; abdomen, white.

Accidental straggler from Europe.

Mr. Chapman[5] records one in the Elliott collection in the American Museum collection labeled "Barnegat, N. J.," and Turnbull mentions one secured on the New Jersey coast.

261 Bartramia longicauda (Bechstein).

Upland Plover, Field Plover.

PLATE 22.

Adults.—Length, 11–12.75. Wing, 6.50–7. Head and neck streaked black and buff; back, etc., barred with the same; wings and middle tail feathers, brownish; outer primary barred with white, rest of tail feathers, white and buff, barred with black; under parts, buff, becoming white on the belly.

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[1] Auk, 1890, p. 328.
[2] O. and O., 1892, p. 53.
[3] Forest and Stream, XXII., p. 364.
[4] Wilson, Bulletin, 1905, p. 27.
[5] Birds Vicinity N. Y., p. 40.

Young in first autumn.—Similar, but deeper buff, with streaks and bars less distinct.

Nest a hollow on the ground, usually in an old upland field; eggs, four to five, cream or buff, with reddish-brown spots clustered about the larger end, 1.75 x 1.25.

Transient, but not common, breeding very rarely. Formerly a common migrant and summer resident in many parts of the State.

They arrive in the Delaware Valley from April 10th to 24th, and are seldom seen after September 10th.

Mr. Babson[1] states that a nest found near Princeton June 30th, 1898, was the only instance of its breeding there in four years, although twenty years ago Professor Phillips told him it was a common summer resident.

Mr. H. W. Fowler[2] found it evidently breeding at Ridgewood, Bergen county, in 1901, and Mr. W. D. W. Miller writes me that it nests near Raritan. At Salem Mr. W. B. Crispin tells me he has seen the young, but never found a nest. Thurber records it as a breeder in Morris county in 1886, and Bonaparte[3] says it was common in summer "on plains near the seacoast." Wilson found it apparently nesting near Burlington in June. It is rare on the coast.

262 **Tryngites subruficollis** (Vieillot).

Buff-breasted Sandpiper.

Adults.—Length, 7–8.50. Wing, 5.10–5.50. Above, grayish-brown, varied with blackish; below, pale buff, with obscure mottlings of black on the breast; axillars, white; inner webs of primaries, white, finely mottled with black; tail feathers, except middle pair, buff, irregularly barred with black.

Young in first autumn.—Similar, but duller, with mottling on primaries still finer.

A rare straggler from the interior of North America.

Turnbull (1869) states that it is rather rare, and generally seen late in autumn.

The only occurrences of the bird with which I am familiar are two specimens secured by Mr. W. M. Swain, one in September, 1898,

[1] Birds of Princeton, p. 43.
[2] Cassinia, 1901, p. 50.
[3] Ann. Lyc., N. Y., II., p. 325.

between the 7th and 21st,[1] half a mile south of Cedar Creek, Barnegat Bay; the other, September 8th, 1899, one and a half miles north of Toms River, on the west shore of the Bay.

263 Actitis macularia (Linnæus).

Spotted Sandpiper.

PLATE 23.

Adults in summer.—Length, 7–8. Wing, 4.10–4.60. Above, grayish-brown, with a slight bronze gloss; feathers mottled with black; tail, narrowly tipped with white; outer feathers more or less obscurely barred with black; lower parts, white, everywhere marked with round black spots smaller on the throat.

In autumn.—Plain bronze-brown above and white beneath, slightly tinged with gray on the chest.

Young in first summer and autumn.—Similar to winter adults, but feathers of upper parts edged with buff and dusky.

Nest a mere hollow on the ground; eggs, three to four, olive-buff, spotted with dark brown and purplish, 1.35 x .90.

Common summer resident, nesting throughout the State wherever conditions are favorable, even along the coast marshes.

Arrives April 20th to 25th; departs October 1st.

Mr. Babson[2] saw one at Princeton as late as November 1st.

The most widely distributed and most familiar of our Sandpipers and almost the only one now breeding in the State. It may be seen running along the mud flats of our rivers and creeks, now taking wing and circling out over the water to alight again a little further on, every now and then uttering its clear whistle or series of short whistles. It nests often quite well away from the water in a grass field or even in a garden, and the downy young can later be found running about with their parents.

264 Numenius americanus Bechstein.

Long-billed Curlew, Sicklebill.

Adults.—Length, 20–25. Wing, 10–11. Above, black and buff; head and neck streaked, other parts barred; below, cinnamon-buff, streaked on the breast with dusky; axillars, nearly plain cinnamon.

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[1] Abst. Proc. D. V. O. C., III., p. 12. Specimen in D. V. O. C. Colln.

[2] Birds of Princeton, p. 44.

Rare and irregular fall migrant.

Formerly regular and frequent both in spring and fall, appearing about the middle of May, according to Wilson, and again in September. He further states that "a few instances have been known of one or two pair remaining in the salt marshes of Cape May all summer. A person of respectability informed me that he once started a Curlew from her nest, which was composed of a little dry grass, and contained four eggs. This was in July." Wilson, however, never saw a nest himself, so that the breeding of the species in the State is not positively established.

Turnbull in 1869 still regarded the "Sickle Bill" as frequent. In 1877 Scott[1] reports it rare at Long Beach, and very shy; seen the middle of April. The only subsequent record with which I am acquainted is a specimen taken by Dr. W. L. Abbott, in Cape May county, September 14th, 1880.[2] Mr. Laurent's[3] remarks on this species in his "Birds of Five Mile Beach" evidently refer to the following.

265 Numenius hudsonicus Latham.

Hudsonian Curlew, Jack Curlew.

Adults.—Length, 16.50–18. Wing, 9–10.25. Differs from the Long-billed Curlew in size and in having the axillars barred with dusky and the lower parts paler buff.

Common transient. April 25th to June 1st, and again July 15th to September 15th.

Mr. Scott[4] found them at Long Beach as early as July 9th in 1877, and Mr. H. W. Hand saw them in spring of 1907 on April 12th.

Mr. Hand found a roosting spot on the meadows on May 23d, 1907, to which great numbers of the birds resorted at dusk.[5]

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[1] Bull. Nutt. Orn. Club, 1879.
[2] Colln. Phila. Acad.
[3] O. and O., 1892, p. 53.
[4] Bull. Nutt. Orn. Club, 1879.
[5] Cassinia, 1907, p. 69.

266 Numenius borealis (Forster).

Eskimo Curlew.

Adults.—Length, 12.50–14.50. Wing, 8–8.50. Differs from the Hudsonian Curlew in smaller size and in having V-shaped marks on the under parts instead of narrow streaks. The head, too, is uniformally streaked, with no light median stripe as in the other species. Inner webs of quills uniform dusky, which at once distinguishes it from the preceding in which they are barred.

Formerly a "rather rare transient in May and September" (Turnbull, 1869); now apparently almost extinct.

Wilson was not acquainted with this species, the bird he called "Eskimo Curlew" being the Hudsonian Curlew, as long ago pointed out by Bonaparte. Nevertheless, both Nuttall and apparently Dr. C. C. Abbott have quoted Wilson's remarks as applying to this species.

The only definite information regarding the occurrence of the Eskimo Curlew in New Jersey is Bonaparte's statement that he had "occasionally met with it in the markets of New York and Philadelphia, though in the middle States it is by no means common."

Family CHARADRIIDÆ.

The Plovers.

Close allies of the Snipe and Sandpipers, but with short bills, and usually with the hind toe lacking.

a. Upper parts speckled.
  b. A small rudimentary hind toe. — Black-bellied Plover, p. 143
  bb. No hind toe. — Golden Plover, p. 143
aa. Upper parts plain.
  b. Two black bands on breast. — Killdeer, p. 144
  bb. One breast band or merely a blotch on each side of the chest, black or gray.
    c. Deep grayish-brown above.
      d. Bill, .50–.55. — Semipalmated Plover, p. 145
      dd. Bill, .80. — Wilson's Plover, p. 146
    cc. Pale brownish-gray above. — Piping Plover, p. 145

270 Squatarola squatarola (Linnæus).

Black-bellied Plover, Bull-head.

Adults in spring.—Length, 10.50–12. Wing, 7.50. Upper part coarsely mottled black and white; crown, largely dusky; forehead and back of neck, white; tail, white at base, rest barred black and white; under parts, sides of face and axillars, black; flanks and under tail-coverts, white.

Adults in autumn.—Above, dull black, thickly spotted with grayish-white; below, white; lower neck, chest and sides of face streaked with gray or dusky.

Young in first autumn.—Similar to winter adults, but spots on upper parts pale yellowish.

Common transient. April 30th to May 22d and August 1st to November 1st.

Dr. W. L. Abbott has taken specimens as late as June 3d, 1879, in the spring flight, in Cape May county, and as late as November 7th, 1877, in the fall. Mr. W. E. D. Scott[1] states that they arrived in late July at Long Beach in 1877.

272 Charadrius dominicus Müller.

Golden Plover.

Adults in spring.—Length, 9.50–10.50. Wing, 6.80–7.40. Similar to the Black-bellied Plover below, but upper parts dusky blackish, spotted with bright yellow; forehead and back of neck, white, as in that species.

Adults in autumn.—Above, similar, lower parts brownish-gray, except the throat and belly, which are white; slightly streaked on the breast.

Young in first autumn.—Similar to winter adults, but yellow spots brighter and a yellow tinge below.

Autumnal transient, very rare in spring. Apparently not abundant on the lower New Jersey coast; certainly much less so than it is about New York, where Mr. Chapman[2] says it is rare in spring, but common in autumn. Like many other shore birds, it seems to fly direct from Long Island to the Delaware coast, thus avoiding New Jersey unless driven in shore by storms.

Its occurrence inland is also irregular. According to Dr. Farr, it is occasionally common during August at Cranbury, near Princeton,[3]

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[1] Bull. Nutt. Orn. Club, 1879.

[2] Birds Vicinity N. Y., p. 41.

[3] Babson, Birds of Princeton, p. 44.

and Mr. Fowler[1] was informed that it was common on the Upper Delaware in 1870. One was shot there also in 1895, and several at League Island on the Delaware September 30th, 1904.[2]

273 Oxyechus vociferus (Linnæus).

Killdeer.

PLATE 24.

Adults.—Length, 10–11.25. Wing, 6.25–6.75. Above, grayish-brown, with a slight bronze gloss; rump, rufous buff; forehead crossed by a white and black bar; a dusky streak from the bill under the eye; throat and collar all around the neck, white, followed by a complete black collar, and this at a short interval by a black breast band; rest of under parts, white; wing feathers marked with white, tail feathers tipped with white and with a subterminal black bar (obscure on middle pair); outer ones largely white and buff, barred on inner web with black.

Nest a hollow, often with small stones as a flooring; eggs, three to four, nearly white, with very dark brown markings.

Tolerably common migrant and local summer resident in the southern half of the State; apparently much rarer in the northern counties. In the southern part of the State it also occasionally winters—Atlantic City, 1905-6 (G. S. Morris);[3] Salem county (Rhoads); Five Mile Beach (Laurent).[4]

It usually arrives March 20th, stragglers appearing in February, and departs by October 25th.

Mr. W. C. Southwick[5] saw one at Raritan February 22d, 1892, a remarkably early date for that vicinity, and one was found at Navesink December 15th, 1888, after the unusual flight of birds that were apparently blown north by the remarkable hurricane that prevailed at that time.[6]

The Killdeer breeds at Princeton (Babson), Plainfield (Miller), Medford (Stone), Salem (Crispin), and near Pennsgrove (Stone), and is given by Thurber as a breeder near Morristown. Mr. S. N. Rhoads saw two June 11th, 1909, in the Wallkill valley, Sussex county.

A familiar bird of old fields, where it may be seen running grace-

[1] Cassinia, 1903, p. 53.
[2] Cassinia, 1904, p. 55.
[3] Cassinia, 1906, p. 59.
[4] O. and O., 1892, p. 53.
[5] Abst. Proc. Linn. Soc., N. Y., V., p. 2.
[6] Chadbourne, Auk, 1889, p. 255.

fully along the ground or taking wing with its wild plaintive cry, "Kill-deer, Kill-deer, Kill-deer."

Its solicitude for nest and young, and its tireless efforts to draw the intruder away from them, are pathetic.

During the migrations Killdeers may be seen along the seashore, but for the most part they are to be associated with the inland pasture fields.

274 Aegialitis semipalmata Bonaparte.

Semipalmated Plover, Ring-neck.

Adults in summer.—Length, 6.50–7.50. Wing, 4.65–5. Grayish-brown above; forehead, white; fore part of crown and band from bill under the eye, black; throat and complete collar, white, followed by a complete black collar; rest of under parts, white, tail with white tip and subterminal black bar; outer feathers largely white.

In autumn.—Black markings replaced by grayish-brown.

Common transient, occurring in May, and again July 19th to October 1st.

Stragglers have been reported on the Delaware and Raritan, and one obtained at Gloucester, May 20th, 1882, is in the collection of the Philadelphia Academy.

277 Aegialitis meloda (Ord).

Piping Plover.

PLATE 25.

Adults in summer.—Length, 6.25–7.50. Wing, 4.50–4.80. Pale gray above, with a white forehead, followed by a narrow black bar; a black spot on each side of the breast, sometimes uniting into a breast band; tail similar to *A. semipalmata*, but paler.

In autumn.—Similar, but black marks replaced by brownish-gray.

Nest a mere hollow in the sand; eggs, three to four, creamy-white, with dark brown spots and markings, 1.25 x 1.

A rare migrant, if indeed it occurs at all in the State. Formerly a common summer resident, breeding on the beaches.

In Wilson's time (1812) it was very abundant on the low sandy shores of the entire seacoast, and he procured his type specimen from a colony breeding in July on Sommer's Beach, at the mouth of Great Egg Harbor. In 1877 Mr. Scott[1] states that they were common on

[1] Bull. Nutt. Orn. Club, 1879, p. 224.

Long Beach, arriving April 16th. The majority went farther north, but a number bred and had fresh eggs June 12th. Mr. R. C. Harlow has a set taken at Beach Haven June 8th, 1886, and Mrs. Drown has a set taken there as late as May 30th, 1887. Krider[1] (1879) says that it bred on Seven Mile and Peck's [=Sommer's] Beaches. By 1889 Mr. Shick[2] reports that it bred only in very moderate numbers at the former locality, though it seems to have been plentiful in 1888, according to Mr. H. G. Parker.[3]

On Five Mile Beach a few bred up to 1892, according to Laurent,[4] and occasionally wintered. Dr. W. L. Abbott took it there in 1879 as early as April 11th. The last records we have are birds seen by Mr. W. L. Baily at Holly Beach July 23d and August 23d, 1896, and at Cape May August 8th, 1897. Stragglers have been reported in former years on the Delaware.[5]

280 Ochthodromus wilsonius (Ord).

Wilson's Plover.

Adults.—Length, 7.50–7.90. Wing, 4.50. Similar to the Semipalmated Plover, but with larger bill; black face stripe restricted to the lores, and black collar merely a breast band; often with a rufous wash on the sides of the head behind the eye.

Very rare straggler from the south. No recent records. Formerly a regular summer resident, but apparently never common, as compared with the Piping Plover.

Wilson discovered this species on May 13th, 1813, on Cape Island (now Cape May City), but did not live to describe it, and George Ord, in publishing Wilson's drawing in the ninth volume of the American Ornithology, named the bird after him. Later Ord and Titian R. Peale made an excursion along the coast and found the species pretty common at Brigantine Beach, and at various localities between Great Egg Harbor and Long Beach.[6]

Wm. M. Baird secured two specimens opposite Cape May Court House July 15th and 17th, 1843.[7] Turnbull in 1869 regarded it as

[1] Field Notes, p. 61.
[2] Auk, 1890, p. 328.
[3] O. and O., XIV., p. 3.
[4] O. and O., 1892, p. 53.
[5] Warren's Report on Birds of Penna., p. 102.
[6] Ord. in Hall's Ed. of Wilson, 1829, Vol. III., p. 156.
[7] Baird, Cassin & Lawrence, Birds of N. A., p. 694.

rather rare, arriving early in May, and Beesley[1] (1857) listed it as a rare breeder.

Mr. Scott[2] did not find it on Long Beach in 1877, nor did Dr. W. L. Abbott or Mr. Laurent find any on Five Mile Beach from 1877 to 1892. There is, however, a set of eggs in Mrs. E. Drown's collection said to have been taken at Beach Haven June 26th, 1886.

In 1886 Mr. H. G. Parker[3] stated that they still bred on Seven Mile Beach, but that is the last record of the species with which I am acquainted. Mr. Shick[4] does not mention them as occurring on this beach in his paper of 1890.

Family APHRIZIDÆ.

THE TURNSTONES.

Close relatives of the Plover and Snipe, and strictly maritime birds, frequenting the beaches and turning over pebbles, shells and beach "trash" in search of food. We have but one species.

283 Arenaria interpres morinella (Linnæus).

Turnstone, Calico-back.

Adults.—Length, 9–9.75. Wing, 6. Above, coarsely mottled with black, white and rusty; back of neck, upper tail-coverts, base and tip of tail, white; throat, sides of face, breast and abdomen, white; a black line from the eye and another from the bill join a large black area covering the lower neck and sides of the breast, and reaching up, almost form a collar.

Young in first autumn.—No rusty on upper parts, breast mottled with dusky.

Common transient, occurring May 1st to June 1st and August 1st to September 15th.

Dr. C. C. Abbott (1868) states that specimens have twice been shot on the Delaware, at Trenton, after severe storms, and there are other records for the river in early years. One of these was a specimen

[1] Geology of Cape May, p. 143.
[2] Bull. Nutt. Orn. Club, 1879, p. 224.
[3] O. and O., 1886, p. 140.
[4] Auk, 1890, p. 326.

shot by Audubon, near Camden, in May, 1824, which served as the subject for his plate of this species.

Dr. W. L. Abbott secured one in Cape May county as late as June 3d in 1879.

Family HÆMATOPODIDÆ.

OYSTER-CATCHERS.

These are large Snipe-like birds with a strong, flat, knife-like bill, which is used to pry open clams and other bivalves upon which they live. They are strictly maritime, and but one species occurs in our State.

286 Hæmatopus palliatus Temminck.

Oyster-catcher.

PLATE 26.

Adults.—Length, 17–21. Wing, 9.80–10.25. Whole head and neck, including upper breast, black; back, brownish; secondaries, upper tail-coverts, base of tail, lower breast and abdomen, white; tip of tail, dusky; bill, red.

Young in first summer.—Similar, but duller, upper parts margined with buff.

Rare straggler from the south.

It occurred regularly in Wilson's time (1812) in small parties of two or three pairs together, and he found nests at Egg Harbor between May 15th and 25th.

Turnbull (1869) and Beesley[1] (1857) both give it as a rare summer resident.

Mr. Scott[2] did not find it at Long Beach in 1877, but Mr. S. N. Rhoads saw three there in the fall of 1880. At Tuckerton one was shot by Mr. Jillson in May, 1894, and another was taken by a gunner on Chester Island, in the Delaware, May 14th, 1891.[3] Mr. W. L. Baily saw three at Wildwood August 9th and 12th, 1896.

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[1] Geology of Cape May, p. 143.
[2] Bull. Nutt. Orn. Club, 1879.
[3] Stone, Birds of E. Pa. and N. J., p. 42.

Order GALLINÆ.

To this group belong the so-called gallinaceous birds—or birds allied to the common Chicken, including nearly all the upland game birds of the world. They are mainly terrestrial and usually associate in flocks or coveys after the nesting season is over.

Family ODONTOPHORIDÆ.

THE QUAIL.

289 Colinus virginianus (Linnæus).

Bob-white, Quail, Partridge.

PLATE 19.

Adult male.—Length, 9.50–10.50. Wing, 4.30–4.70. Above, chestnut, barred and speckled with black; rump, grayer; inner edges of tertials edged with buff; wing and tail feathers, gray; forehead, a band below the eye, and a half collar around the chest, black; throat and line from bill over the eye and down the side of the neck, white; a band of chestnut below the black half collar; rest of under parts white, tinged with buff and barred with black; sides, flanks and crissum broadly striped with chestnut.

Adult female.—Similar, but throat and stripes over the eye, buff, and scarcely any black on the head or chest.

Nest a hollow usually in a field among grass; eggs, ten to eighteen, white, 1.20 x .95.

Resident, varying in abundance in different years, sometimes nearly exterminated in severe winters. Quail are migratory to some extent, and flights are noticed at Cape May toward the end of October, but the species is always present in the State. In order to prevent its extermination sportsmen have introduced birds from the south and southwest, so that it is questionable whether any true unmixed *C. virginianus* remain. Mr. F. M. Chapman reports a typical Florida Bob White, *C. v. floridanus,* taken near New York City.[1]

The Bob White is one of our best known game birds, called also Quail in the northern States and Partridge in the south—neither of

[1] Abst. Proc. Linn. Soc., N. Y., IV., p. 5.

which names is, strictly speaking, correct, as the bird is materially different from both the Quail and Partridge of Europe.

In the spring we hear the clear, sharp whistle of the male from which the name "Bob White" is taken. The birds are then paired and busy with their nest or young. By autumn the whole family is associated in a "covey," roosting on the ground in the grass, and taking wing very suddenly when approached.

The Bob White is best known to the gunner, but the farmer has good cause to know him and protect him. He is a famous insect eater, and among the species which he habitually devours are the Potato beetle and Chinch bug, two of our worst pests.

Family TETRAONIDÆ.

The Grouse.

a. Tarsus feathered down to the toes. — Heath Hen, p. 151
aa. Tarsus feathered above, bare below. — Ruffed Grouse, p. 150

300 Bonasa umbellus (Linnæus).

Ruffed Grouse, Pheasant.

PLATE 27.

Adult male.—Length, 15.50–19. Wing, 7–7.50. Above, rufous, streaked and mottled with black, buff and gray; a tuft of glossy black feathers on each side of the neck; tail sometimes gray, sometimes rusty red; a broad subterminal black band and numerous narrower bands and vermiculations; below, pale buff, or nearly white, barred with dusky, and with more or less black across the breast.

Adult female.—Similar, but neck tufts much smaller.

Nest a hollow among dead leaves, usually at the base of a tree; eggs, eight to twelve, pale buff, 1.55 x 1.15.

Resident, but common only, in the wilder and thickly wooded districts. The Ruffed Grouse—the "Partridge" of the northern States and "Pheasant" of the South—is a bird equally as misnamed as the Bob White, so far as these popular terms are concerned. It is a woodland species, and in the spring the males may be heard producing their curious booming sound known as drumming. During the per-

formance they mount a dead log and flattening the tail upon it rapidly vibrate the wings against the air.[1] Much discussion was formerly indulged in as to the method by which the sound was produced, but all doubts have now been settled and the bird even photographed in the act.

With the extermination of the Wild Turkey and the Heath Hen, the Grouse becomes our largest upland game bird, but unfortunately it, too, is decreasing as the timber is cut away, as it must have thick cover for its welfare.

306 Tympanuchus cupido (Linnæus).

Heath Hen, Eastern Prairie Chicken.

Adult male.—Length, 17–19. Wing, 8.60–9.40. Above, barred with dusky, brown and buff; scapulars with conspicuous buff spots; under parts, white, broadly barred with dark brown; chin and throat, buff; tail, brownish, tipped with white, a tuft of not more than ten lanceolate, pointed black feathers mottled with buff on each side of the neck, with a patch of bare skin below them capable of inflation.

Adult female.—Similar, but with neck tufts much reduced and tail barred.

Nest similar to that of the Ruffed Grouse; eggs, six to thirteen, creamy-buff, with a slight tinge of green, 1.70 x 1.25.

The Heath Hen is now extinct in New Jersey and throughout its former habitat, with the exception of Martha's Vineyard, where a small remnant of the species still remains. It was very similar to the Prairie Chicken of the West, which is likewise disappearing rapidly.

The home of the Heath Hen in New Jersey was the extensive sandy areas known as the "Plains," extending westward from Barnegat and Tuckerton, which are covered with a growth of low, stunted oaks and pines only a foot or two in height.

Krider[2] states that he shot the birds here in 1840, and Turnbull, in 1869, says, "Within the last year or two it has been found in the Jersey Plains." This, however, seems to mark the time of its final extinction.

A writer in Doughty's Cabinet of Natural History, in 1832,[3] says, "The barrens of Gloucester, and other counties of this State, have been the most celebrated grounds, east of the Allegheny, for this chief of our feathered game. In former years they were in great abundance

[1] See E. J. Sawyer, Bird Lore, 1908, p. 246.
[2] Field Notes, p. 56.
[3] Pages 15, 16.

on these barren grounds which were then visited by old and scientific sportsmen, who regarded the laws of shooting. But lately, through great persecution by those who have no claims to the principles which constitute sportsmen and who visit these grounds months before the season commences by law and while the birds are in an unfledged state, the Grouse are driven from this favorite abode. Year after year has this unhallowed persecution of the Grouse been carried on, until the species has been almost exterminated from the State."

Family MELEAGRIDÆ.

The Turkeys.

310 Meleagris gallopavo silvestris (Vieillot).

Wild Turkey.

Adult male.—Length, 48–50. Wing, 21. Distinguished from the domestic Turkey by the deep rusty tip to the tail, and chestnut instead of white tips to the upper tail-coverts; the dewlap, moreover, is but little developed, if at all.

Long since extinct in New Jersey. Letters of early voyagers show that Turkeys must have occurred throughout the State as they found "stores of them" in Cape May county.[1]

Family PHASIANIDÆ.

The Pheasants.

To this group belong the common Chicken and the introduced English Pheasant.

Phasianus colchicus Linnæus.

Ring-necked Pheasant.

Adult male.—Length, 30. Wing, 10. Tail, 18–20. General color coppery chestnut, with bright purple and bronze reflections; neck, metallic blue; tail, long and pointed, with darker crossbars.

[1] Beesley Geol. of Cape May, p. 166.

Adult female.—Brownish mottled and varied with dusky; lower parts, plain; tail, barred.

Young males in first autumn.—Similar to female.

Eggs, buff or greenish-buff, eight to fourteen, 1.50 x 1.30.

These birds were introduced in nearly all the counties of the State in 1897,[1] and again at Princeton in 1900,[2] and probably elsewhere, but they do not seem to have established themselves. Perhaps this is just as well, as it is claimed that the blackhead disease so fatal to Turkeys is spread by the Pheasants through the fields and woodlands where Turkeys feed, so that raising the latter in a country stocked with Pheasants is impossible, and in the same way the native Ruffed Grouse is said to disappear when Pheasants are established.

Order COLUMBÆ.

Family COLUMBIDÆ.

THE PIGEONS.

These birds form a very well marked group typified by the domestic Pigeon.

We have now but one wild species in the State, the Mourning Dove, though formerly the Passenger Pigeon occurred, and once the Ground Dove strayed within our boundaries.

Two of the characteristic peculiarities of Pigeons are the soft, more or less swollen, cere at the base of the bill and the habit of drinking without raising the head or removing the bill from the water.

a. Wing under 4.	GROUND DOVE, p. 155
aa. Wing over 5.	
b. Rump plumbeous.	PASSENGER PIGEON, p. 154
bb. Rump grayish-brown.	MOURNING DOVE, p. 155

[1] Rept. N. J. Fish and Game Com., 1898; also, *Oologist*, 1898, p. 81.

[2] Babson, Birds of Princeton, p. 25.

315 Ectopistes migratorius (Linnæus).

Wild Pigeon, Passenger Pigeon.

PLATE 28.

Adult male.—Length, 15–17.25. Wing, 8–8.50. Head, neck and rump, plumbeous; back, grayish-brown; some black spots on the wing-coverts and scapulars; an iridescent patch on each side of the neck; under parts, vinaceous; belly and under tail-coverts, white; tail, black at base, passing into blue-gray with a white tip; middle pair of feathers, uniform dusky brown.

Adult female.—Similar, but head and breast grayish-brown, and iridescence on neck much duller.

Young in first summer.—Similar to female, but feathers of head, wing-coverts and breast edged with white.

Nest of small sticks, loosely put together on the branch of a tree; eggs, one or two, white, 1.50 x 1.02.

We may safely say that the Wild Pigeon is extinct in New Jersey, if not throughout its former range. While there have been numerous rumors of Pigeons having been seen, the fact remains that for about ten years none have been secured, while many supposed Pigeons proved to be Doves.

The former wonderful abundance of the bird and its wanton slaughter are now matters of history.

David Pieterson DeVries, one of the early explorers of Delaware Bay, states that in April, 1633, when he crossed from Cape Henlopen to Cape May, an immense flight of Wild Pigeons obscured the sky, and Peter Kalm in 1725 tells us how, in Philadelphia, people killed them from their house-tops as they flew over.

While such occurrences are long past, there are yet many men living who remember the Pigeon as a common bird regularly shot in the autumn. For thirty years, however, it has been rare, and it only remains for us to list the last specimens that have been taken, so far as they have been recorded:

Englewood (two); September, 1878. F. M. Chapman.[1]
Haddonfield; March 22d, 1879. W. L. Abbott, M.D.[2]
Morris Plains; September 16th, 1885. Thurber.[3]
Morristown; October 7th, 1893. A. B. Frost.[2]
Englewood; June 23d, 1896. C. Irving Wood.[4]

[1] Auk, 1889, p. 302.
[2] Cassinia, 1907, p. 84, in Colln. Acad. Nat. Sci., Phila.
[3] Birds of Morris county.
[4] Chapman, Auk, 1896, p. 341.

316 Zenaidura macroura carolinensis (Linnæus).

Mourning Dove.

PLATE 29.

Adult male.—Length, 11–13. Wing, 5.70–6. Grayish-brown above; crown, plumbeous; coverts and tertials spotted with black; under parts, vinaceous; an iridescent metallic patch on the side of the neck, and a black spot below the ear; tail feathers, plumbeous, with a black band across the middle; outer ones, white, terminally; middle pair, dark brown.

Adult female.—Duller, with less iridescence.

Young in first summer.—Similar to female, but feathers largely tipped with white.

Nest a platform of twigs on the branch of a tree; eggs, two, white, 1.15 x .80.

A common summer resident, arriving early in March, and occasionally remaining throughout the winter.

The Dove is in appearance a small edition of the Wild Pigeon, and as it is often hard to gauge the size of a flying bird, it is not surprising that they should often be mistaken for Pigeons. In fact, I have seen an old Pigeon hunter shoot what he was positive was a Wild Pigeon only to have it prove to be a Dove.

Doves are common about orchards, where they often nest, and are likewise found on the ground in open fields or along the roadside.

In autumn they collect, sometimes in large flocks.

320 Chæmepelia passerina terrestris (Chapman).

Ground Dove.

Adult male.—Length, 6.75. Wing, 3.60. Above, brownish-gray, becoming dusky on the tail and bluish-slate on the crown; forehead and under parts, vinaceous; breast feathers dusky in the center; base of bill, red; tips of tail feathers, white; inner webs of wing quills, rufous.

Female.—Similar, but forehead and under parts brownish-gray.

Very rare straggler from the South. Turnbull says that John Krider shot one near Camden in the autumn of 1858. Krider himself says: "I was out hunting Quail in November, and on my return towards the ferry through a thick pine wood this bird flew up from the ground." [1]

[1] Field Notes, p. 56.

Order RAPTORES.

Birds of Prey.

Family CATHARTIDÆ.

The American Vultures.

These birds are not closely related to the Vultures of the Old World, which they resemble in habits, but which are more nearly allied to the Hawks and Eagles.

The Turkey Vulture is a common species in New Jersey, while the Black Vulture is but an accidental straggler.

a. Wings reaching to or beyond the tip of the tail; tail rounded.
Turkey Vulture, p. 156

aa. Wings not reaching beyond the middle of the tail; tail square.
Black Vulture, p. 157

325 Cathartes aura septentrionalis (Wied).

Turkey Vulture.

Adults.—Length, 26–32. Wing, 20–23. Plumage, brownish-black; darker on upper surface where feathers are edged with grayish; in fresh plumage, the black is slightly glossy, but later becomes dull brownish; head and fore part of neck, red, unfeathered; bill, white.

Young in first autumn.—Similar, naked skin of head dusky; bill, blackish.

Downy young, white, with head dusky gray.

Nest, none; eggs, two, laid on the ground under an overhanging rock or a fallen tree top, white, coarsely spotted with chocolate and lavender, 2.70 x 1.85.

Common resident in Southern New Jersey, from Camden and Ocean counties southward, ranging north in summer, more or less regularly, to Sandy Hook (Chapman),[1] Plainfield (Miller), Lebanon, Hunterdon county (S. A. Kram),[2] and Princeton (Babson).[3] Casually farther; Muscontiang Valley, Morris county (Caskey); Summit (Hann), and Orange county.[4]

[1] Birds Vicinity of N. Y., p. 43.
[2] Abst. Proc. Linn. Soc., N. Y., VIII., p. 4.
[3] Birds of Princeton, p. 46.
[4] Reynolds, Forest and Stream, XVIII., p. 181.

Summer or winter one seldom fails to see Turkey Vultures in southern New Jersey soaring high overhead in graceful flight, or in the former season often assembling in considerable numbers where some choice piece of carrion offers them an opportunity to enjoy a feast. The wrangling, clumsy birds, with their worn and dingy plumage and naked pink heads, as they tear and devour the entrails of some dead animal, offer a sharp contrast to the graceful navigators of the air, and when we add the all-pervading odors that attend such a feast, most persons are content to view their Turkey Vultures when sailing at a distance.

Their nesting site is some low, dark wood or some pile of rocks which furnishes a safe retreat, and here the two little Vultures remain clad in pure white down until they have reached the size of a hen, when the black feathers begin to appear. They do not stray far from the spot where they were hatched, and are visited by the parents, and fed by regurgitation, the carrion passing from their overloaded crops into the throats of the young. The latter not infrequently again disgorge as a means of defense against too inquisitive intruders.

326 Catharista urubu Vieillot.

Black Vulture.

Adult.—Length, 23–27. Wing, 16.50–17.50. Plumage, dull black; under surface of wings near the base, whitish; naked head, blackish; bill, dusky.

A very rare straggler from the South. Mr. Robert Lawrence says, "A specimen was shot at Sandy Hook during the spring of 1877; it is now in my collection," [1] and Dr. C. C. Abbott (1868) says, "Probably the rarest of the visiting species," but gives us no clue as to what his statement was based upon. There is no other record for the State.

[1] Bull. Nutt. Orn. Club, 1880, p. 116.

Family BUTEONIDÆ.

The Hawks and Eagles.

These are the typical birds of prey with their powerful curved claws and beak. The family as a whole has gotten a bad name with the farmers as destroyers of poultry, but all intelligent men to-day should be willing to set aside the prejudice of generations and accept the results of modern scientific investigation into the food habits of these birds, which shows beyond the possibility of a doubt that, with the exception of two of our Common Hawks and one or two of those which visit us at rare intervals, these birds are of the greatest benefit to us, living almost entirely upon mice and larger insects. The most familiar species, the large Red-tailed and Red-shouldered Hawks, commonly but erroneously called "Chicken Hawks," and the Marsh Hawk, are in fact our very best friends.

The injurious species are the long-tailed more slender species, the Cooper's Hawk, Sharp-shinned Hawk and Goshawk.[1]

a. Tarsus feathered down to the toes.
b. Wing over 20. Golden Eagle, p. 165
bb. Wing under 18. Rough-legged Hawk, p. 164
aa. Tarsus not feathered, its front covered with small rounded scales like the sides and back. Fish Hawk, p. 168
aaa. Tarsus not feathered, its front covered with broad transverse plates different from the small granular scales on the sides and back.
b. Tail deeply forked, outer feathers 12 to 14 long. Swallow-tailed Kite, p. 159
bb. Tail not forked.
c. Wing over 20. Bald Eagle, p. 165
cc. Wing under 18.
d. Head bluish-slate, centered with rufous. Sparrow Hawk, p. 167
dd. Head not slaty and rufous.
e. Rump white. Marsh Hawk, p. 160
ee. Rump not white.
f. Upper parts slaty-gray.
g. Below white, transversely marked with dark slate and somewhat streaked with blackish. Goshawk, p. 162
gg. Below white, barred with rusty and slightly streaked with the same.
h. Wing over 8.75. Cooper's Hawk, p. 161

[1] The species of the families Falconidæ and Pandionidæ are included in the key so as to cover all the Hawks and their allies.

hh. Wing under 8.75.
SHARP-SHINNED HAWK, p. 161

ggg. Below pinkish or buffy-white, slightly streaked on breast and broadly spotted on the belly with dusky. DUCK HAWK, p. 166

ff. Upper parts brown, mottled with white and rusty.

g. Tail rusty red. RED-TAILED HAWK, p. 162

gg. Tail blackish, with three narrow white bars.
RED-SHOULDERED HAWK, p. 163

ggg. Tail dusky, with one broad white bar and one or two obscure narrower ones.
BROAD-WINGED HAWK, p. 164

gggg. Tail dark slaty or brown.

h. With about seven narrow broken bars of rusty or buff. DUCK HAWK, p. 166

hh. With four broken bars of rusty or buff.
PIGEON HAWK, p. 167

ggggg. Tail grayish, with four broad dusky bands (younger birds).

h. Wing over 12. GOSHAWK, p. 162

hh. Wing, 9–11. COOPER'S HAWK, p. 161

hhh. Wing less than 8.75.
SHARP-SHINNED HAWK, p. 161

gggggg. Tail with about eight narrow dusky bands on gray, white or rusty ground (younger birds).

h. Many of the primaries rusty or whitish on the outer web.
RED-SHOULDERED HAWK, p. 163

hh. Primaries all dusky on the outer web.

i. Wing over 14.
RED-TAILED HAWK, p. 162

ii. Wing under 12.
BROAD-WINGED HAWK, p. 164

327 Elanoides forficatus (Linnæus).

Swallow-tailed Kite.

Adult.—Length, 19.50–25.50. Wing, 15.40–17.50. Back, wings and tail and tip of tertials, glossy black; rest of plumage, white; tail, deeply forked.
Young in first autumn has the head streaked with dusky.

A rare straggler from the south. The following specimens have been taken: One shot by John Krider, near Philadelphia, in 1857, recorded by Turnbull, doubtless the same referred to by Krider[1] as shot in New Jersey. Mr. Harold Herrick[2] records one at Chatham,

[1] Field Notes, p. 10.
[2] Forest and Stream, XII., 1879, p. 165.

and in Thurber's list[1] two are reported seen by L. P. Shirrer and George Held, at Morristown, September 18th, 1887. Another was procured at Jerseytown, Pa., on the Delaware, by Mr. William Kester,[2] August 18th, 1894. Dr. C. C. Abbott[3] reported seeing one near Bordentown, July 28th, 1883, but subsequently[4] changed the date to November, 1883. Mr. J. Harris Reed[5] saw one in southern Cumberland county, June 4th, 1893, and Mr. C. F. Silvester[6] saw one some years ago near Princeton.

According to Mr. Babson[6] Dr. Abbott states that taxidermists had shown him specimens of the Mississippi Kite shot in New Jersey. The record, however, does not seem sufficiently explicit to warrant inclusion in the list.

331 Circus hudsonius (Linnæus).

Marsh Hawk.

Adult male.—Length, 19.50–24. Wing, 13–16. Above, bluish-gray; darker on the crown and back; nape streaked with white or buff; rump, white; under parts, white, with scattered spots of rusty, especially on the sides; tail, gray, obscurely barred with dusky; outer feathers more or less white, barred with reddish-brown.

Adult female.—Brown above; rump, white; head, shoulders and coverts streaked or spotted with buff; below, pale buff, heavily streaked with brown.

Young in first winter.—Brown above; rump, white; occiput streaked with white or rusty; wing-coverts spotted with rusty; under parts, rich rufous buff; breast slightly streaked with brown.

Nest on the ground in marshes; eggs, four to six, pale bluish-white, 1.80 x 1.40.

Common resident, but a rare breeder in the southern half of the State and less common in winter in the northern half.

A hawk of the open meadows, sailing low over the ground when searching for mice and always identified by the conspicuous white rump. Adult males are rare, most of the birds being in the brown plumage. Nests regularly at Summit (Holmes), Newton (Philipp), Paterson (Clark), etc. One nest was found by Mr. W. E. D. Scott, at Long Beach, June 28th, 1877,[7] and another set from there is in

[1] Birds of Morris county.
[2] R. Kester, Cassinia, 1903, p. 76.
[3] Science, Vol. II., No. 29, 1883, p. 222.
[4] Birds of Mercer county.
[5] Stone, Birds of E. Pa. and N. J., p. 85.
[6] Babson, Birds of Princeton, p. 46.
[7] Bull. Nutt. Orn. Club, 1879.

Mrs. Drown's collection, taken June 25th, 1886, while Professor A. H. Phillips has found a nest on Phillips' meadows, near Princeton.[1] Beesley reported it nesting in Cape May county in 1857,[2] and on May 13th, 1900, Mr. Robert T. Moore[3] found a nest at Griscom's Swamp, back of Great Egg Harbor.

332 Accipiter velox (Wilson).

Sharp-shinned Hawk.

PLATE 30.

Adult male.—Length, 10–11.50. Wing, 6.10–7.10. Above, bluish-gray; head, darker; throat and sides of head, white or buffy, with black shaft lines; rest of under parts, white, thickly barred with rufous; tail, gray, with several dusky bars.

Adult female.—Length, 12.50–14. Wing, 7.80–8.80. Similar to male, but browner.

Young in first year.—Brown above; under parts, white, streaked with brown; tail, grayish-brown, broadly barred with dusky. Younger (?) birds have strong rufous edgings above and under parts strongly suffused with buff.

Nest of sticks in a tree; eggs, three to five, bluish-white, coarsely blotched with chocolate, 1.45 x 1.15.

Apparently a rather rare breeder in New Jersey, and most plentiful in spring and fall, though present all the year.

The Sharp-shinned Hawk is a small edition of Cooper's Hawk, and exhibits the same disparity in the size of the male and female.

It is also, like Cooper's Hawk, destructive to small birds, and I have found the remains of a dozen in a nest occupied by young nearly ready to fly.

It is one of the few Hawks that are not entitled to protection.

333 Accipiter cooperi (Bonaparte).

Cooper's Hawk.

Adult male.—Length, 14–17. Wing, 8.90–9.40.

Adult female.—Length, 18–20. Wing, 10.10–11. Plumage at all stages similar to the Sharp-shinned Hawk.

Nest in a tree; eggs, three to five, pale bluish-white, 1.90 x 1.45.

[1] Babson, Birds of Princeton, p. 47.
[2] Geology of Cape May, p. 138.
[3] Cassinia, 1908, p. 29.

Cooper's Hawk is a more common breeder than the Sharp-shinned, and, like it, is most common in migrations, being rare in winter in the northern part of the State.

This is probably our most destructive Hawk, and much damage to poultry and small birds that is charged up to the harmless Red-tailed and Red-shouldered Hawks belongs to this species. In fact, the only other species which are injurious are the Sharp-shinned, Goshawk and Duck Hawk, but the last two are too rare to require much consideration. If the poultry yard defender would learn to distinguish the Cooper's Hawk, instead of slaughtering the beneficial Hawks as well, he would find it to his advantage, as these other species live almost entirely upon field mice and grasshoppers.

334 Astur atricapillus (Wilson).

Goshawk.

Adults.—Length, 22–24. Wing, 12–14. Above, bluish-gray, with narrow black shaft lines; nape somewhat streaked with white; head, dusky; under parts, white finely vermiculated with gray and with black shaft lines; under tail-coverts, white; tail, gray, obscurely banded with dusky.

Young in first year.—Brown above, spotted and edged with buff; head and neck with buff streaks; under parts, white or pale buff, streaked all over with brown; tail broadly barred with brown and buff.

A rare winter visitant from the north.

In some years the Goshawk is rather plentiful, but generally it is rare or absent. The winter of 1895-6 was a notable one for Goshawks, even as early as November. They were also plentiful in 1906, occurring as far south as Cape May Point.

This, like its close relatives, the Sharp-shinned and Cooper's Hawks, is a destructive species.

337 Buteo borealis (Gmelin).

Red-tailed Hawk.

PLATE 31.

Adults.—Length, *male*, 19–22; *female*, 23–25. Wing, 14–17. Upper parts, dark brown, edged with grayish, buff and white; wing-coverts, uniform; under parts, white, streaked across the abdomen with brown; sides of neck and body

more or less streaked with brown or rufous; tail, bright rufous, with a dusky subterminal band.

Young in first year.—Similar, but tail brown, barred with dusky; under surface with more brown streaks, but no rufous.

Nest in tall trees; eggs, two to four, dirty white, slightly marked with rusty brown, 2.35 x 1.80.

Common resident, but most abundant in winter and during migrations.

This is the common large hawk of the Delaware meadows during the winter, and like its relatives, the Red-shouldered and Broad-winged Hawks, it is a valuable bird to the farmer, destroying thousands of meadow mice in winter and grasshoppers in summer.

Hawks of this and various other kinds often associate in large straggling flocks during the autumn migrations.[1]

339 Buteo lineatus (Gmelin).

Red-shouldered Hawk.

Adults.—Length, 17.50–21. Wing, 12–14. Above, dark brown, edged with grayish, buff and white; lesser wing-coverts strongly edged with rufous; under parts, rufous, with narrow white crossbars; throat, whitish, streaked with dusky; crissum, white; tail, dark brown, with distinct, rather narrow white crossbars.

Young in first year.—Very similar to young of the Red-tail, but usually more regularly streaked below, and always identified by the white spots on the outer edge of the outermost primary, which is uniform brown in the Red-tail.

Nest in tall trees; eggs, three to five, dirty white, blotched or streaked with rusty brown or chocolate, 2.15 x 1.75.

Common resident, but apparently a more common breeder in the northern half of the State.

Habits similar to those of the Red-tailed Hawk, which it very closely resembles during the first year.

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[1] *Cf.* Cassinia, 1904, p. 65; Abst. Proc. D. V. O. C., III., p. 11; Forest and Stream, 1893, p. 513; Amer. Nat., VIII., p. 338.

343 Buteo platypterus (Vieillot).

Broad-winged Hawk.

Adults.—Length, 14–18. Wing, 10–11.50. Above, dark brown, edged with buff and gray; lower parts, white, heavily barred with buffy-brown; tail, dark brown, with two bars and a terminal band of gray.

Young in first year.—Similar, but under parts white, somewhat tinged with buff, and streaked with brown; tail, grayish, with indistinct dusky bars and a light tip. Easily recognized from the Red-tail and Red-shouldered Hawk by its smaller size and the fact that only three instead of four outer primaries are notched on the inner web.

Nest in trees; eggs, two to four, dirty white, blotched with rusty brown or ochraceous, 1.90 x 1.55.

A resident species in the southern part of the State and summer resident in the north, but nowhere common in the winter and not as abundant as the Red-shouldered Hawk in summer.

347a Archibuteo lagopus sanctijohannis (Gmelin).

Rough-legged Hawk.

Adults.—Length, 20–23. Wing, 16–18. Above, dark brown, edged with white or buff; tail, white or buff at the base, and with several light bars; under parts, buffy-white, spotted with black, spots often confluent on the belly; sometimes the entire plumage is black except the bars on the wings and tail.

Young in first year.—Browner, without bands on the tail.

Distinguished in all plumages from all our other hawks by having the tarsus feathered all the way to the toes.

Winter visitant from the north, but usually not common and not uniformally distributed, apparently much more plentiful on the Delaware meadows than elsewhere. Some entirely black individuals were formerly shot every year, but such birds are now rarely seen. The Rough-leg seems to be rare on the coast, but a specimen was shot at West Creek, Ocean county, March 8th, 1909.

Meadow mice constitute almost the entire food of this Hawk while it is with us.

349 Aquila chrysaëtos (Linnæus).

Golden Eagle.

Adults.—Length, *male*, 30–35; *female*, 35–40. Wing, *male*, 23–24; *female*, 25–27. Entire plumage, brown, except the back of the head and tarsi, which are more or less buff or tawny, and the tail, which is somewhat streaked with gray.

Young birds have the basal half of the tail and the tarsi white.

Distinguished at all times from the Bald Eagle by the fact that the feathering on the tarsus extends to the toes.

Rare and irregular visitant. The following specimens have been captured in the State:

Vineland; February, 19th, 1868. In collection John H. Sage.[1]

Rocky Hill, near Princeton; March, 1881. Collection Wm. C. Osborn.[2]

Crosswicks Creek; autumn, 1888. W. E. Daw.[3]

Cape May; October 20th, 1892. J. Milford.[4]

New Egypt; 1893. Collection of C. A. Voelker.[5]

Long Branch; August, 1897; caught alive.[6]

Moorestown; November 8th, 1901. Collection Moorestown Nat. Hist. Soc.[7]

352 Haliæetus leucocephalus (Linnæus).

Bald Eagle.

PLATE 32.

Adults.—Length, *male*, 30–35; *female*, 34–43. Wing, *male*, 20–25; *female*, 24–28. Head, neck and tail, pure white; remainder of plumage, dark brown; bill and feet, yellow.

Young birds.—Entire plumage, dark brown, more or less edged with white; tail, brown, somewhat mottled with white; bill, black.

Nest in tall tree; eggs, two, dull white, 2.75 x 2.10.

Resident in the southern part of the State, but much rarer than formerly. Of irregular occurrence elsewhere.

The Bald Eagle formerly nested regularly about Beesley's Point, where Wilson observed it about 1808. He describes how his friend and companion, George Ord, then a young man, climbed up to one of the nests only to find it empty.

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[1] J. H. Sage, Auk, 1895, p. 179.
[2] Babson, Birds of Princeton, p. 48.
[3] Dr. W. C. Braislin, Auk, 1896, p. 81.
[4] C. A. Voelker, Abst. Proc. D. V. O. C., II., p. 6.
[5] Stone, Birds of E. Pa. and N. J., p. 88.
[6] F. M. Chapman, Auk, 1898, p. 54.
[7] W. B. Evans, Cassinia, 1901, p. 51.

In 1892 I saw young birds that had been taken from a nest in Timber and Beaver Swamp, Cape May county, and Mr. W. B. Crispin has found several nests in Salem county. One contained eggs March 5th, 1905, and another February 27th.[1]

Back of West Creek and Tuckerton, at a location known as "Eagleswood," these birds have long been of frequent occurrence, and undoubtedly nest, but the wanton killing of them is rapidly causing their extermination.

Now and then an Eagle may be seen flying high overhead in various parts of the State, and specimens have been shot at Princeton, Haddonfield, etc.

Family FALCONIDÆ.

The Falcons.

356 Falco peregrinus anatum (Bonaparte).

Duck Hawk.

Adults.—Length, *male*, 16–18; *female*, 18–20. Wing, *male*, 11.50–13; *female*, 13–14.50. Dark plumbeous above, with buff bars on the primaries, and obscure black bars on the tail; tip of tail, white; below, buff, streaked or spotted with black on the sides.

Young in first year.—Upper parts, brown, edged with rusty or buff; below, deep buff, streaked with brown.

Nest merely a ledge of rock; eggs, three to four, cream or reddish-buff, thickly marked with brown of several shades, 2.05 x 1.55.

The Duck Hawk is a tolerably common transient visitant, and occasionally remains through the winter in the southern counties. It breeds on the Palisades of the Hudson,[2] in the northern part of the State, and on the Nockamixon Cliffs on the Pennsylvania side of the Delaware.

While Duck Hawks feed mainly upon other birds, they confine their attention for the most part to water birds, and seldom visit the poultry yard. The statement made by George Ord, and copied by others, to the effect that this bird nested in the cedar swamps of South Jersey, was evidently hearsay and quite erroneous, as he adds that he and Wilson were unable to find a nest.

[1] *Cf.* also, E. J. Darlington, Oologist, 1906, p. 106.

[2] *Cf.* Wm. P. Lemmon, Osprey, IV., p. 42.

357 **Falco columbarius** Linnæus.

Pigeon Hawk.

Adults.—Length, *male*, 10–11; *female*, 12–13. Wing, *male*, 7.50; *female*, 8.50. Above, bluish-slate, with black shaft streaks; tail, black, tipped with white and barred with gray; wings, black, with white bars on inner webs; bases of feathers on the hind neck, white and buff; under parts, buff, whiter on breast and throat; everywhere streaked with black.

Young in first year.—Brown above, with tail and wing markings buff; under parts, deep buff, streaked with blackish-brown.

A rather common transient visitant, most frequent along the coast. In southern New Jersey it is a casual winter resident.

It has been observed as late as April 21st, and as early as September 14th.

Dr. C. C. Abbott has mentioned this species as breeding near Trenton, but there is no confirmation in the experience of others, nor has its nest been found nearer than the mountainous parts of northern New York, so far as I am aware.

360 **Falco sparverius** Linnæus.

Sparrow Hawk.

PLATE 33.

Adults.—Length, *male*, 9–10.50; *female*, 9.50–12. Wing, 6.60–8.10. Crown, blue-gray, with rufous center; wing feathers, black, with white bars; coverts, blue-gray, spotted with black; back and scapulars, rufous chestnut, barred with black; rump and tail, rufous chestnut, with a broad black subterminal band and gray tip; lateral feathers, barred gray and black; under parts, buff, becoming white on throat and abdomen, more or less spotted with black on the sides and breast; sides of face, white, with two vertical black bars.

Adult female.—Head like the male; upper parts, including the tail, chestnut rufous, barred with black; wings, black, with rufous bars; under parts, white, tinged with buff and streaked, except on the throat and flanks, with light brown.

Young.—Similar to adults.

Nest in a hollow tree; eggs, four to five, cream, spotted with reddish-brown, 1.35 x 1.10.

A common resident still more common during migrations.

One of our most familiar hawks, nesting in hollow trees or old Woodpeckers' nests. In summer it may be seen hovering over the fields catching grasshoppers and field mice, which constitute the bulk of its food.

Family PANDIONIDÆ.

The Fish Hawks.

364 Pandion haliaëtus carolinensis (Gmelin).

Osprey. Fish Hawk.

Adult male.—Length, 21–25. Wing, 17–21. Above, grayish-brown; tail barred with dusky and tipped with white; head, neck and under parts, white, a dusky stripe on the side of the head and some dusky feathers on the crown; sometimes with spots or blotches of brown on the breast.

Adult female.—Similar, but breast always with brown spots.

Young in first year with light edgings to the feathers of the upper parts.

Nest very bulky, of sticks, etc., in a tree top; eggs, two or three, cream blotched with chestnut-brown, 2.40 x 1.80.

Formerly an abundant summer resident along the sea coast and Delaware Bay, March 20th to November, but of late years greatly reduced in numbers, though still a familiar bird along the coast.

The enormous nest, occupying the top of some dead tree, is a familiar sight. Often both birds are perched upon it and perhaps we can see the heads of the young also. The old bird, when disturbed, utters its peculiar whistling cry quite unlike most hawk calls. The Fish Hawks are fearless birds, nesting close to houses and even on platforms built for their use on poles planted in the farmer's fields, or on telegraph poles. They often make use of very low trees, and in some instances—though not in New Jersey, so far as I am aware—nest on the ground.

They fly out over the bay or ocean in search of their prey, and diving from considerable altitudes, come up with the fish wriggling in their talons. When Bald Eagles were more abundant along the coast many a Fish Hawk was pursued and compelled to drop his prey so that the Eagle might grasp it and carry it off. The Fish Hawk never attempts to pick up a fish that he has dropped but goes patiently back to the sea and catches another. The birds are now most abundant along the northern coast of New Jersey where they have always been carefully protected and on the mainland of the Cape May peninsula. On the coast islands the persecution of egg collectors and the spread

of the resorts has almost exterminated them. Mr. C. S. Shick[1] writes that in 1884 fully one hundred pairs nested on Seven Mile Beach, while in 1890 not a quarter of that number remained. To-day I may add that I believe there are none nesting on the island at all. Mr. Crispin tells me they are still fairly abundant breeders in Salem county. Inland they occur as casual visitors during summer.

Family ALUCONIDÆ.

The Barn Owls.

The Barn Owl is distinguished from the other species by its nearly bare tarsi, which in our other Owls are feathered. It also has the inner toe as long as the middle one, while the inner edge of the middle claw is pectinated.

365 Aluco pratincola (Bonaparte).

Barn Owl.

Adults.—Length, 21–25. Wing, 17–21. Above, ochraceous rufous, overlaid with gray and minutely spotted with black and white; tail, whiter; under parts, white or buff; face, white, with a chestnut spot near the eye; wing and tail feathers obscurely barred.

Nest in a hollow tree or similar cavity; eggs, four to six, white, 1.70 x 1.30.

Rather common resident through the southern half of the State; less plentiful northward, where it has been found breeding at Princeton (Babson),[2] Plainfield (Miller), Summit (Holmes).[3] A specimen was taken by Dr. J. Dwight, Jr., at Chatham, November 8th, 1890,[4] and Mr. F. M. Chapman[5] records its presence at Englewood on several occasions, while Thurber records two shot at Whippany, Morris county.

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[1] Auk, 1890, p. 328. *Cf.* also, Shick, Bay State Oologist, I., No. 2, pp. 13–15; Norris, O. and O., 1891, p. 162; Wheeler, Oologist, 1888, p. 147; "Old Salt," Oologist, 1886, p. 49.

[2] Birds of Princeton, p. 50.

[3] Wilson, Bulletin, 1905, p. 9.

[4] Abst. Linn. Soc., N. Y., IV., p. 3.

[5] Auk, 1886, p. 485; 1889, p. 303.

The Barn Owls are "at home" in some spacious hollow tree, or in some steeple or barn that offers an interior shelter and a hole for entrance. Here the pair rest during the day, and start out at dusk to scour the meadows for mice of all sorts, which constitute their food, and often we find a supply of these rodents laid away in the nest hole. The eggs are often laid at considerable intervals, and young of various sizes may be found in the same nest.

Family STRIGIDÆ.

The Horned Owls, Etc.

Owls, like Hawks, are for the most part very beneficial as destroyers of mice. Only one species, the Great Horned Owl, ever raids the poultry yard.

The Owls are nocturnal birds of prey resembling the Hawks in many ways, but probably more intimately related to the Picarian stock from which have come the Goatsuckers, Parrots, etc. They have flat faces with large eyes directed forwards, the face surrounded by a "ruff" and often with two ear-like tufts on the top of the head, that of course have nothing to do with the ears, which are large openings located just behind the eyes.

a. Wing, 14.50–18.
  b. Wing, 14.50–16; plumage brown, mottled with buff, rusty and white. Great Horned Owl, p. 174
  bb. Wing, 16–18; plumage gray, mottled with dusky. Great Gray Owl, p. 173
  bbb. Wing, 17.30–18.70; plumage white, more or less barred with dusky. Snowy Owl, p. 175

aa. Wing, 11.50–14.
  b. Breast barred, belly streaked with dusky. Barred Owl, p. 172
  bb. Breast streaked, belly barred with dusky. Long-eared Owl, p. 171
  bbb. Entire under parts buff, streaked with dusky. Short-eared Owl, p. 171

aaa. Wing, 9; tail long and pointed. Hawk Owl, p. 175

aaaa. Wing, 5.25–7.10.
  b. Wing over 6, horned. Screech Owl, p. 174
  bb. Wing under 6, not horned. Saw-whet Owl, p. 173

366 Asio wilsonianus (Lesson).

Long-eared Owl.

Adults.—Length, 13–16. Wing, 12. Upper parts, brown, vermiculated with white and varied more or less with rufous or buff; "ear tufts" prominent; under surface, buffy-white, streaked and mottled with brown; face, rufous, black around the eyes; throat, white; wing-coverts spotted with white; tail and wing quills barred with brown.

Nest usually an old nest of a Hawk or Crow; eggs, four to seven, white, 1.55 x1.35.

A resident, though somewhat irregular in its distribution, and often much more common in winter.

Their nests have been found at Plainfield and New Providence (Callender) late in May, and as far south as Salem (Crispin), on March 21st, 1908; also at Princeton (Babson).

At Yardville Miss Rachel Allinson writes me that a colony of Long-eared Owls roosted in the evergreens in her yard regularly from the winter of 1902-3 to that of 1905-6, and sometimes individuals remained as late as May 29th. Mr. Babson records a similar gathering at Princeton.[1]

367 Asio flammeus (Pontoppidan).

Short-eared Owl.

Adults.—Length, 14–16.50. Wing, 12–13. Upper parts striped with buff and dark brown; wing quills with white spots; tail, barred; under parts, white or buff, streaked with brown; face, whitish or buff; eye region, black.

Nest on the ground in marshy localities; eggs, four to seven, 1.55 x 1.25.

This bird is a rather common winter resident in open meadows or marshes, October to March, generally occurring in colonies, the individuals roosting close together among the grass. Mr. W. E. D. Scott[2] reports about two hundred of these Owls at Harlingin Station, near Princeton, in 1878-9. Mr. S. N. Rhoads found a colony on the marshes near Tuckerton in the winter of 1893-4, and I have several times seen them on the Delaware meadows. I know of but three definite records of nests in the State. One with six eggs, near

[1] Birds of Princeton, p. 50.

[2] Bull. Nutt. Orn. Club, 1879, p. 83.

Canton, Salem county, May 9th, 1905, found by W. B. Crispin; one at Long Beach, June 28th, 1878, by W. E. D. Scott, and another set of eggs in Mrs. Drown's collection from Beach Haven.

Dr. Abbott states, in his Birds of Mercer County, that he has frequently found this species "breeding in hollow trees near Trenton."[1] This remarkable statement must surely refer to the Barn Owl, especially as Dr. Abbott says later, "nests usually on the ground, in one instance I found the nest in a huge hollow of an old maple."[2]

368 Strix varia Barton.

Barred Owl.

Adults.—Length, 20–24. Wing, 13–14. Grayish-brown above barred with white; face, gray, with dusky concentric rings; below, dull grayish-white; barred on breast; striped on abdomen with brown; bill, yellow; eyes, dark brown.

Nest usually in hollow trees; eggs, two to four, white, 1.95 x 1.65.

Resident and apparently rather more plentiful in the northern part of the State.

A number of nests have been taken about Summit by Messrs. Hann and Callender, and nests are found at Plainfield (Miller),[3] Montclair (Green)[4] and Newton, Sussex county (Phillip).

At Princeton three nests have been found,[5] and at Salem Mr. W. W. Justice, Jr., got a nest in April, 1897,[6] while Mr. C. S. Shick records a pair of birds on Seven Mile Beach, May 10th, 1890, which were probably breeding.[7]

In Camden county I have seen it most frequently in winter.

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[1] Naturalist's Rambles About Home, p. 468. *Cf.* also, comment in Auk, 1885, p. 87.

[2] Birds About Us, p. 180.

[3] Bird Lore, 1907, p. 173.

[4] Oologist, 1893, p. 230.

[5] Babson, Birds of Princeton, p. 51.

[6] Abst. Proc. D. V. O. C., II., p. 24.

[7] Auk, 1890, p. 328.

370 Scotiaptex nebulosa (Forster).

Great Gray Owl.

Adults.—Length, 25–30. Wing, 16–18. Brownish-gray, mottled with white; face, gray, barred with black; below, grayish-white; breast streaked and abdomen barred with brown; bill and eyes, yellow.

Very rare straggler in winter. Thurber (1887) records one shot near Mendham many years ago, and Dr. C. C. Abbott (1868) states that one was killed in Sussex county in December, 1859. I know of no other record for the State.

372 Cryptoglaux acadica (Gmelin).

Saw-whet Owl, Acadian Owl.

Adults.—Length, 25–30. Wing, 16–18. Brown above; forehead narrowly streaked; back and wings spotted with white; tail with several narrow white bars; under parts, white, coarsely streaked with reddish-brown; feet, white; face, white; eye ring and ear-coverts, dusky.

Winter resident; apparently regular, but somewhat variable in abundance or local. Mr. Babson records but two at Princeton during his experience, but in the winter of 1878-9 Mr. W. E. D. Scott took about twenty-five,[1] eighteen between December 1st and 11th.[2]

Our records for South Jersey are Cape May, December 1st, 1904 (Hand); Friendship, December 20th, 1899 (W. B. Evans);[3] May's Landing, December 2d (S. N. Rhoads);[4] Cape May Point (Spaeth); Haddonfield, November 15th, 1907.

This is our smallest Owl, and is easily overlooked.

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[1] Birds of Princeton, p. 51.
[2] Bull. Nutt. Orn. Club, 1879, p. 85.
[3] Abst. Proc. D. V. O. C., IV., p. 2.
[4] Abst. Proc. D. V. O. C., II., p. 7.

373 Otus asio (Linnæus).

Screech Owl.

PLATE 34.

Adults.—Length, 8–10. Wing, 6–7. Two phases—(1) Bright rufous above with black shaft lines, and scapulars spotted with white; tail and wings barred with dusky; under parts, white, streaked with black and rufous; feet and face, white. (2) Brownish-gray above, streaked and vermiculated with dusky and buff; scapulars and wing feathers spotted with white; under parts, white, finely barred with gray and coarsely streaked with black.

Young in first summer transversely barred above and below with gray, white and rufous.

Nest in hollow trees; eggs, five to seven, white, 1.35 x 1.20.

Common resident throughout the State.

This is our most abundant and most familiar Owl, nesting in old orchards, which furnish convenient natural hollows or old Woodpeckers' nests. At dusk they frequently fly about one's head, snapping their bills, and their hoot is familiar to all. This species is peculiar among all our birds in exhibiting two phases of plumage independent of age, sex or season. Red and gray birds pair indiscriminately, and the young in one family may be of either color.

375 Bubo virginianus (Gmelin).

Great Horned Owl.

Adults.—Length, *male*, 18–23; *female*, 22–25. *Wing*, 15–16. Upper parts finely vermiculated with dark brown and white, the former predominating, and more or less varied with rufous; wings with broad dusky bars; face, rufescent; throat, white; breast rufescent, with large black blotches; abdomen barred with white and dusky; feet, buff; eyes, yellow.

Nest usually an old nest of a Crow, etc.; eggs, two to four, white, 2.25 x 1.85.

A rather rare resident. Nests have been found at Bay Head, February 23d, 1907 (Hann); at Montclair, March 14th, 1903 (Callender); two at Princeton (Babson), and one pair had young in an old Great Blue Heron's nest near Salem in April, 1904 (Crispin).

This is our largest Owl, except the very rare Great Gray Owl, and, unlike all our other species, will take chickens and game birds when opportunity offers.

376 Nyctea nyctea (Linnæus).

Snowy Owl.

Adults.—Length, *male*, 20–23; *female*, 23–27. Wing, 16–17. White, somewhat barred above and below with dusky; female more heavily barred than the male; eyes, yellow.

Irregular winter visitant, occurring some seasons in considerable numbers.

Mr. W. E. D. Scott states that it was very plentiful in the winter of 1876-7[1] at Long Beach. Several were obtained in 1886-7 in Morris county (Thurber), and in November, 1889, a number occurred in northern New Jersey.[2]

Mr. Laurent[3] saw one at Anglesea, December 20th, 1890, and Mr. H. W. Hand reports a pair at Cape May, November 26th, 1905, one of which was killed.

377a Surnia ulula caparoch (Müller).

Hawk Owl.

Adults.—Length, 15–17.50. Wing, 9. Upper parts, dark brown, spotted with white; upper tail-coverts and tail barred with white; lower parts, white; breast, abdomen, sides and under tail-coverts regularly barred with brown; peculiar in its long, pointed tail.

A very rare straggler from the North in winter. Only two records for the State, both given by Dr. C. C. Abbott. One bird killed in Mercer county, 1858, the other in Middlesex county, in 1861.

[1] Bull. Nutt. Orn. Club, 1879.
[2] Forster, Forest and Stream, November 28th, 1889.
[3] O. and O., 1892, p. 54.

Order COCCYGES.

Cuckoos and Kingfishers.

Family CUCULIDÆ.

THE CUCKOOS.

We have two species of Cuckoos, which closely resemble one another. Unlike the English Cuckoo they build nests of their own and hatch their own young.

a. Inner webs of wing feathers rufous, outer tail feathers with conspicuous white tips. YELLOW-BILLED CUCKOO, p. 176

aa. Inner webs of wing feathers not rufous, outer tail feathers with narrow inconspicuous tips. BLACK-BILLED CUCKOO, p. 177

387 Coccyzus americanus (Linnæus).

Yellow-billed Cuckoo.

PLATE 35.

Adults.—Length, 11–12.50. Wing, 5.60. Above, brownish-gray, with a slight greenish gloss; the wing feathers mainly rufous on the inner webs; three outer tail feathers, black, tipped with white; under parts, grayish-white; upper mandible, black; lower, yellow.

Young in first summer.—Similar, but feathers somewhat edged with buff above.

Nest a rather loose platform of twigs with a thin lining of grass, usually in the lower branches of a tree or in a thick bush; eggs, three to five, pale greenish-blue, 1.20 x .90.

Common summer resident; arrives May 3d (May 9th), departs October 15th.

Although apparently generally distributed over the State the Cuckoos are not conspicuous birds, their subdued colors and habit of concealing themselves in the thick foliage causes them to be overlooked.

Their note is a series of short clucking calls, growing louder and less rapid and ending in several loud syllables "cow, cow, cow, cow."

The birds are frequently called Rain Crows, from the idea that their calling foretells rain, and "Cow" bird from their note. Unlike the

Cuckoos of Europe they are not parasitic, but always construct nests of their own.

The food of the Cuckoos consist almost exclusively of insects; some of these are beetles, bugs and grasshoppers, but almost half of the entire food of the Cuckoo, while he is with us, consists of caterpillars, and, after careful study of the subject, the experts of the United States Department of Agriculture have estimated that one bird devours between two and three thousand caterpillars during the five months of his stay.

388 Coccyzus erythrophthalmus (Wilson).

Black-billed Cuckoo.

Adults.—Length, 11–12.50. Wing, 5.50. Above, grayish-brown, with a slight greenish gloss; wing feathers with no rufous on the inner webs; tail like the back, with a very narrow white tip and subterminal dusky band on all but the middle pair; bill entirely black; under parts, grayish-white.

Young in first summer.—Similar, feathers slightly edged with buff above.

Nest similar to that of the preceding species; eggs, darker blue, 1.15 x .85.

Regular summer resident; more common in the upper half of the State. Arrives May 6th (May 11th), departs October 15th.

This Cuckoo is similar in habits and notes to the Yellow-billed species, from which it is best distinguished by the lack of distinct white tips to the tail feathers.

Family ALCEDINIDÆ.

THE KINGFISHERS.

We have only one species of Kingfisher in Eastern North America.

390 Ceryle alcyon (Linnæus).

Belted Kingfisher.

PLATE 36.

Adult male.—Length, 11–14. Wing, 6.25. Above, bluish-gray, everywhere spotted or barred with white; under parts, white, extending up on the sides of the neck, so as to almost meet above; a broad breast band and sides of the body bluish-gray.

Adult female.—Similar, but sides, as well as an additional band across the belly, rufous.

Nest a horizontal burrow in a sand bank six to seven feet deep; eggs, five to seven, pure white, 1.35 x 1.05.

Common summer resident, or rarely resident. It has been reported in winter as far north as Plainfield (Miller) and Morristown (Thurber).[1] Arrives March 14th (March 26th), departs November 1st.

The Kingfisher is a conspicuous bird along the larger streams, as well as along the coast, where his loud rattling call may be heard as he flies along ahead of us, alighting now and then on some dead tree, post or telegraph wire. Mr. C. S. Shick (Auk, 1890, p. 328) states that he found a nest in a hollow stump on Seven Mile Beach, which he felt sure had been occupied by a pair of Kingfishers which had frequented the vicinity all summer.

The food of these birds consists entirely of fish, which they catch in their powerful bills, diving into the water in pursuit of their prey.

Order PICI.

Family PICIDÆ.

THE WOODPECKERS.

The peculiarities of Woodpeckers are (1) their habit of perching against the upright trunks of trees, for which purpose their tail feathers are stiffened and sharp-pointed; (2) their strong chisel-like bill and powerful barbed tongue, with which they dig into the wood after boring insects or carve out their nest cavities; (3) their peculiar arrangement of toes, two being directed forward and two backward, a condition found among our other birds only in the Cuckoos.

a. Wing over 9. PILEATED WOODPECKER, p. 182
aa. Wing under 7.
b. Under side of wing and tail and quills yellow. FLICKER, p. 184
bb. Wing, tail and quills not yellow.
c. More or less red on the throat.
d. Entire head red, rest of under parts white. RED-HEADED WOODPECKER, p. 183
dd. Throat and crown more or less red, breast black, belly yellowish. YELLOW-BELLIED SAPSUCKER, p. 181

[1] O. and O., XI., p. 91.

cc. No red on the throat.
d. Breast black, throat white.
YELLOW-BELLIED SAPSUCKER (female), p. 181
dd. Breast and throat brown or dusky, more or less obscurely mottled.
e. Rump white. RED-HEADED WOODPECKER (young), p. 183
ee. Rump barred.
YELLOW-BELLIED WOODPECKER (young), p. 181
ddd. Lower surface uniform gray, belly slightly red.
RED-BELLIED WOODPECKER, p. 184
dddd. Lower parts white or grayish-white.
e. Back striped longitudinally.
f. Wing, 3.75. DOWNY WOODPECKER, p. 179
ff. Wing, 4.75. HAIRY WOODPECKER, p. 179
ee. Back barred. RED-COCKADED WOODPECKER, p. 180

393 Dryobates villosus (Linnæus).

Hairy Woodpecker.

Adult male.—Length, 8.50–9. Wing, 4.75. Coloration essentially like the Downy Woodpecker, except that the three outer tail feathers are white, with some black on the inner webs near the base, but no bars.

Adult female and young differ, as in the Downy Woodpecker.

Nest in a dead tree trunk; eggs, four to six, glossy white, .95 x .70.

Regular resident, less abundant than the Downy Woodpecker, and much less frequently seen about dwellings, being more or less a bird of the forest.

Similar in habits and food to the Downy Woodpecker. Its note is louder.

394 Dryobates pubescens medianus (Swainson).

Downy Woodpecker.

PLATE 37.

Adult male.—Length, 6.50–7. Wing, 3.70. Above, black; nostril tufts and stripe over each eye, white; a white spot on each side of the neck, running in a narrow stripe to the base of the bill; a broad white stripe down the back; wings spotted with white; three outer tail feathers, white, barred with black; a scarlet crescent on the hind neck; under parts, dull white.

Adult female.—Similar, without the scarlet on the hind neck.

Young in first summer.—Similar to the adult female, but head somewhat mottled with white or red.

Nest in a dead tree trunk; eggs, four to six, glossy white, .75 x .60.

Resident and universally distributed.

This, our commonest Woodpecker, excepting only the Flicker, is a familiar inhabitant of our orchards and woodlands, hewing out its nest, after the manner of its kind, in some dead tree trunk, and later piloting its speckled family about from tree to tree, digging out the insects which lurk under the bark and in the rotten wood.

In winter it is, perhaps, more conspicuous than in summer, and comes closer to our dwellings, even pecking at the suet that we have fastened up in the tree for our winter bird friends.

The note of the Downy is a sharp metallic "pink, pink," often rapidly repeated in a rattling cry, and quite as characteristic is the "roll" which he beats with his bill on some hollow limb, and which can be heard at long distances through the silent wood.

The reports of the United States Department of Agriculture show that seventy-four per cent. of the food of this Woodpecker is composed of insects, largely beetles, while the twenty-five per cent. is vegetable matter—seeds and berries—taken largely during the winter when insects are scarce.

395 Dryobates borealis (Vieillot).

Red-cockaded Woodpecker.

Adult male.—Length, 8.40. Wing, 4.65. Above, barred with black and white; crown, black, with a small spot of bright red on each side at the back of the head; a black stripe from the base of the bill to the shoulder; under parts, white; sides and under tail-coverts streaked or spotted with black.

Female.—Similar, but without red on the head.

This southern species is given as rare in Turnbull's List (1869), but whether it occurred in New Jersey or Pennsylvania is not specified. Audubon gives its range as from Texas to New Jersey, but no details are furnished. Bonaparte did not know it from north of Virginia, nor Wilson from north of North Carolina. In fact the only positive evidence that we have of its occurrence in New Jersey is one specimen in the collection of Mr. George N. Lawrence, taken at Hoboken.[1]

[1] Lawrence, Ann. Lyc. Nat. Hist., N. Y., VIII., 1867, p. 201.

402 Sphyrapicus varius (Linnæus).

Yellow-bellied Sapsucker.

Adult male.—Length, 7.75–8.75. Wing, 4.90. Above, irregularly mottled with blue-black and yellowish-white; crown of head, crimson red, bordered by blue-black behind; wings, blue-black, coverts largely white, forming a longitudinal stripe; primaries and secondaries barred with white; tail, black, middle feathers largely white on inner webs; outer ones narrowly edged with white; under parts, yellowish-white; throat, crimson, bordered with black on the sides and with a large black breast patch below; sides streaked with dusky; a white band from the nostrils down the side of the neck and another from over the eye around the hind neck.

Adult female.—Similar, but crown glossy blue-black and throat white.

Young in first summer and autumn.—Similar, but duller, more brown above; under parts, dull brown, indistinctly barred with dusky; males soon show scattered red feathers on the crown, and acquire the full plumage late in winter or early in spring.

Common transient. In spring, March 9th to April 12th; in autumn, September 10th to October 20th. Occasional winter resident. Plainfield (Miller), Summit (Holmes), Haddonfield (Stone), Newfield (Paschall), etc.

This species is unlike any of our other Woodpeckers, a true "Sapsucker," and the regular girdles of small holes, which we not infrequently find, especially upon the fruit trees, are his work. From these holes he is enabled to drink abundantly of the sweet sap, but insects, as is usual with the Woodpeckers, form the bulk of his food; these he catches in the usual manner, or picks them up as they approach his sap holes, or again sails out after the manner of a flycatcher and catches them on the wing. The note of the Sapsucker is weaker than that of the Downy Woodpecker. Like other Woodpeckers the young of this species migrate southward while still in the "juvenal" or first summer plumage and where they happen to remain all winter or late in the autumn, it is possible to note the acquirement of the brilliant red or white marks of the adult.

Mr. W. E. D. Scott took a specimen at Princeton, October 21st, 1876, which approaches the sub-species *nuchalis* of the west which has the nape red. The specimen is now in the Princeton University Collection.[1]

[1] Babson, Birds of Princeton, p. 53.

405 Phlœotomus pileatus abieticola (Bangs).

Northern Pileated Woodpecker.

Adult male.—Length, 17–19. Wing, 9–10. Above, blackish-brown; head strongly crested, entirely scarlet above, a narrow white line bordering the crest below, and another white stripe from the nostril down the side of the neck; a scarlet patch at the base of the bill; throat, white; rest of under parts, brown; basal half of wing feathers, white, which is very conspicuous in flight.

Adult female.—Similar, but red restricted to the hind part of the crest.

Nest in a tree trunk; eggs, white, three to six, 1.30 x 1.

Rare or accidental visitant; possibly more regular in the extreme northwestern part of the State. Formerly generally distributed.

This splendid Woodpecker disappears everywhere with the destruction of the forest, and although the southern part of the State contains tracts wild enough for his liking, the trees there are now too small for his needs. Two specimens, taken in Cape May county by Dr. W. L. Abbott, November 7th, 1878, and December 31st, 1878, are in the collection of the Academy of Natural Sciences, Philadelphia,[1] and Mr. Chapman[2] records one taken at Englewood in 1885 by Mr. Jacob Ullrich.[2] Thurber records one taken at Mountville, Morris county, and Messrs. H. G. Parker[3] and C. S. Shick[4] saw one or two on Seven Mile Beach in 1886. On March 25th, 1908, Mr. George S. Morris saw one of these birds on the Egg Harbor River, above May's Landing, which is our latest New Jersey record. In Captain Bendire's Life Histories of N. A. Birds, Vol. 2, p. 107, is a record of a nest on West Creek, Cumberland county, which was found by Messrs. M. L. C. Wilde and J. Harris Reed,[5] June 4th, 1893. It contained young.

[1] Stone, Auk, 1894, p. 137.
[2] Auk, 1889, p. 303.
[3] O. and O., XI., p. 140.
[4] Bay State Orn., I., No. 2, p. 13.
[5] See, also, Wilde, Atlantic Slope Nat., I., p. 27.

406 Melanerpes erythrocephalus (Linnæus).

Red-headed Woodpecker.

PLATE 38.

Adult.—Length, 9.50. Wing, 5.40. Entire head, throat and upper breast, bright crimson red; back, wings and tail, glossy blue-black; rump, secondaries, tertials and tips of outer tail feathers, white; lower part of the body, white, with a wash of red on the middle of the abdomen.

Young in first summer and autumn.—Head, grayish-brown, finely mottled with dusky; back barred transversely gray and blue-black; secondaries and tertials, white, barred with black; under parts, dull white; whole throat and breast thickly streaked with dusky.

Nest and eggs as in other Woodpeckers; eggs, 1 x .75.

Local summer resident, and occasional resident.

This beautiful bird is rare in southern New Jersey, and, so far as I am aware, is never found in the pine barrens. Young birds have been noted occasionally to pass the winter at Haddonfield (Rhoads), Moorestown (Evans) and Yardville (Allinson).

I saw an adult May 7th, 1896, north of Salem, and Mr. W. L. Baily saw another at Ocean City May 5th of the same year. I do not recall any definite record of its breeding south of Haddonfield, and even there it is irregular. Beesley (1857), gives it as a breeding species in Cape May county, but some of his records are obviously erroneous.

At Princeton Mr. Babson[1] states that a few years ago it was a common summer resident, and not infrequent in winter, but at the time he wrote (1901) it had become rare.

In the northern part of the State it is more plentiful, but irregular. At Paterson Mr. J. H. Clark reports it as an irregular but rare permanent resident, sometimes tolerably common in April and May. Nests in June, preferring telegraph poles along some retired road. Mr. W. D. W. Miller regards it as rather rare at Plainfield, but sometimes common in fall. In the Passaic Valley, Great Swamp region and on the Raritan it is more plentiful.[2] Messrs. H. H. Hann and J. P. Callender have found it nesting at Chatham, Hanover and Summit, but report it very local. Mr. Caskey regards it as rather rare at

[1] Birds of Princeton, p. 54.

[2] Cassinia, 1903, p. 6.

Morristown. At the last locality,[1] as well as at Plainfield,[2] it has been found in winter. At Orange[3] Mr. T. M. Trippe reported it as very rare, and Mr. J. Van Rensselaer, Jr.,[4] states that only one has been seen in ten years.

409 Centurus carolinus (Linnæus).

Red-bellied Woodpecker.

Adult male.—Length, 9–10. Wing, 4–5. Whole top of head and back of neck, brilliant scarlet; rest of upper parts transversely barred with black and white; under surface, pale gray; center of abdomen washed with red.

Adult female.—Similar, but head gray on top; red only on hind neck and nostril plumes.

Irregular straggler from farther south.

Dr. C. C. Abbott reports a nest of this species in Ocean county May 29th, 1861. No one else has found it breeding in the State, and there seem to be only three other records of its occurrence, one at Keyport, November 23d, 1887;[5] one at Newton, November 16th, 1889,[6] and another at Cape May Point, April 11th, 1903.[7] Mr. Babson states that Mr. Scott saw some at Princeton, but gives no definite data.

412 Colaptes auratus luteus Bangs.

Flicker.

PLATE 39.

Adult male.—Length, 12.50. Wing, 5.50–6.50. Above, brownish-gray, transversely barred with black; top of head, plain ashy-gray, with a bright scarlet crescent across the back of the neck; rump, white; upper tail-coverts, white, barred with black; primaries, secondaries and tail feathers, black, with yellow shafts and yellow underneath; secondaries with gray notches on the outer webs; under side of body vinaceous, becoming paler and slightly yellowish posteriorly; a black stripe on each side at the base of the bill; a broad black crescent on the breast, and rest of sides and abdomen thickly marked with round black spots.

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[1] O. and O., XI., p. 91.
[2] Osprey, II., p. 91.
[3] Amer. Nat., VII., p. 389.
[4] Oologist, 1895, p. 79.
[5] Foster, Forest and Stream, XXIX., p. 363.
[6] Lewis, Auk, 1890.
[7] Pennock, Cassinia, 1903, p. 75.

Adult female.—Similar, but lacks the black marks at the base of the bill.

Young in first summer.—Similar, but duller; breast band and scarlet crescent not so well developed; sometimes the whole top of the head is tinged with red.

Nest in a tree trunk; eggs, five to nine, glossy white, 1.10 x .90.

Abundant summer resident and occasional resident. Arrives February 17th (March 13th), departs November 10th.

The Flicker is one of our most familiar and abundant birds. In the spring the loud, rapid call, "kuk, kuk, kuk, kuk, kuk, kuk," etc., is heard from every piece of woodland, as well as the peculiar "whi-chew, whi-chew," uttered as the birds chase each other around a tree trunk. The Flicker has also a single loud call note. In habits and structure it differs from all other Woodpeckers, being partly terrestrial and a great devourer of ants, these insects constituting forty-five per cent. of its food, as many as three thousand having been found in a single stomach by Professor Beal. The Flicker also eats more berries and seed than other Woodpeckers. In flight it is easily recognized by the conspicuous white rump.

Mr. T. M. Trippe records several specimens, shot at Orange, which had red feathers in the black malar stripe, thus approaching the Western Red-shafted Flicker.[1]

Order MACROCHIRES.

Goatsuckers, Swifts and Hummingbirds.

Family CAPRIMULGIDÆ.

THE GOATSUCKERS.

These are nocturnal or semi-nocturnal birds, peculiar in their short bill, very large mouth and long narrow wings. They make no nest, but lay their eggs on the bare ground. Their food consists entirely of insects.

a. Plumage finely mottled black and white, a large white spot on the middle of the wing, no bristles at the mouth. NIGHTHAWK, p. 186

aa. Plumage brown and buff, no white on the wing, long bristles at the sides of the mouth. WHIP-POOR-WILL, p. 186

[1] Amer. Nat., VII., p. 498.

417 Antrostomus vociferus (Wilson).

Whip-poor-will.

PLATE 40.

Adult male.—Length, 9.50–10. Wing, 5.50–6.50. Head with bold black streaks on a grayish ground (color composed of very fine black and white mottlings); back mottled with ochraceous and black with several large black spots; middle tail feathers and rump, blackish, minutely mottled with pale gray; three outer tail feathers, black basally, white terminally; wings, black, with broken rusty bars; under parts mottled with black and pale buff, a white half collar across the throat.

Adult female.—Similar, but the three outer tail feathers black, narrowly edged with buff, and throat band buff instead of white.

No nest; eggs, two, dull white, with pale grayish blotches, laid on the dead leaves in woods; size, 1.50 x .85.

Common summer resident, but in many counties local, probably most abundant in the pine barren region. Arrives April 27th, departs October 1st.

The Whip-poor-wills are especially abundant through the swamps of the pine barrens, where they begin to be active at dusk, coming out into the clearings and chasing one another about, now alighting on a low branch, now on the fence or hitching post, and again on the ground or doorstep, and every few moments repeating rapidly the "whip-poor-will, whip-poor-will;" there is a preliminary "chok" which is only heard when close to the bird. I have lain awake at night, close to the edge of a clearing where these birds were calling, and counted upwards of thirty successive repetitions of the call before the performer would pause. In the daytime they are occasionally flushed from the ground in swamps and woodlands.

They are wholly insectivorous.

420 Chordeiles virginianus (Gmelin).

Nighthawk.

PLATE 41.

Adult male.—Length, 9–10. Wing, 7.50–8.25. Above, black, irregularly mottled with white and buff; white marks more numerous on the wings; primaries, black, the five outer ones with a broad band of pure white across the middle of

both webs; tail, dusky, with bars of lighter mottling and subterminal white spots on all but the middle pair; below, breast black mottled with buff and white; half collar on throat, pure white; entire abdomen, sides and crissum barred black and white.

Adult female.—Similar, but no white spots on the tail, and throat patch buff.

No nest; eggs, two, laid on the bare ground, grayish-white, thickly mottled all over with dull brown, 1.20 x .85.

Common summer resident. Arrives April 30th (May 11th), departs October 10th.

The Nighthawk is most frequently seen just before dusk flying high overhead in an irregular jerking manner, now and then diving toward the ground, his long, narrow wings conspicuous from the white spots, which look from below like holes. As he flies he utters a peculiar harsh cry, which can be heard at a great distance, and seems to come from much closer at hand than it really does. During the daytime the Nighthawks may be found on the ground, or on some log or fence rail, their mottled plumage blending well with their surroundings and rendering them inconspicuous.

They are wholly insectivorous, and capture their food on the wing.

Family MICROPODIDÆ.

The Swifts.

These birds are similar to Swallows, but have longer, narrower wings, and projecting spines at the end of the tail feathers. We have but one species.

423 Chætura pelagica (Linnæus).

Chimney Swift.

PLATE 42.

Adults.—Length, 4.75–5.50. Wing, 5–5.25. Above, sooty black; feathers with a slight gloss on the central part; wings, black, with a slight bluish sheen; under parts, sooty gray; throat and upper breast, pale gray; a jet black spot in front of the eye.

Young in first summer.—Similar.

Nest a basket-like structure of dead twigs fastened together and to the inside of the chimney in which it is located by a gluey substance secreted by the bird; eggs, four to six, pure white, .75 x .50.

Abundant summer resident. Arrives April 17th (April 22d), departs October 10th.

The Chimney Swift is familiar to everyone, circling about in its rapid flight over our houses or fields, now rapidly plying its narrow pinions, and then, with set curved wings, sailing through the air.

It is always on the wing except when it drops down into the chimney and rests, clinging against the sooty walls. Its food consists entirely of insects; its note is a long, rapid twitter.

The Swift is popularly known as the Chimney Swallow, but it is not related to the swallows, the superficial resemblance being due to adaption to the same mode of life. Originally the Swifts nested in hollow trees, but they seem to have entirely abandoned this habit, although Mr. S. N. Rhoads has found them nesting at Haddonfield in an old barn, the nest being attached to the boards.

Family TROCHILIDÆ.

THE HUMMINGBIRDS.

There is but one species of Hummingbird in Eastern North America.

428 Archilochus colubris (Linnæus).

Ruby-throated Hummingbird.

PLATE 43.

Adult male.—Length, 3.10–3.25; female, 3.60. Wing, 1.60–1.80. Upper parts, brilliant metallic green; wings, dusky, coverts edged with green; lower parts, white on breast, dusky on abdomen, sides tinged with green; whole throat, brilliant metallic crimson.

Adult female.—Similar, but crimson on throat lacking.

Nest externally of lichens, lined with fine down, placed on the upper side of a limb; eggs, two, white, .50 x .35.

Common summer resident. Arrives May 3d (May 9th), departs September 25th.

This is the smallest of our birds, a gem of tropical bird life, which wanders far north of the usual range of its family. Our most familiar view of the Hummingbird is in the garden as he poises himself on

rapidly vibrating wings before some flower, resembling almost exactly in size and flight the Hummingbird Moth or Sphinx, which has the same habit. Sometimes we may see him rest for a time on a branch, and one which often visits my garden perches on the clothesline.

The food of the Hummingbird consists of minute insects and the nectar of flowers.

Hummingbirds are distributed throughout the State, but seem to be particularly abundant in Cape May county, where their favorite flower, the Trumpet Creeper, occurs as a wild plant.

Order PASSERES.

Perching Birds.

To this order belong nearly all of our familiar inland birds—almost one-half of the total number of species found in the State. Of the 167 species of land birds (exclusive of birds of prey and game birds), 152 belong to this group.

They comprise all our most valuable insect destroyers and song birds—such as Sparrows, Warblers, Thrushes, Wrens, Swallows, etc.

GENERAL KEY TO THE SPECIES OF PASSERINE BIRDS.

Special keys are given under each family, but as it is difficult to select obvious family characters except in a few instances, this general key has been prepared, by which any of the smaller land birds may be identified or referred to their proper families, except the Woodpeckers, Kingfisher, Cuckoos, Whip-poor-will, Night Hawk, Swift and Hummingbird, which have already been covered in the key to higher groups on p. 36.

a. Bill distinctly *flat*, broad at the base, and well provided with bristles; head slightly crested; colors plain white, gray or pale yellow below; brown, olive or slaty above. FLYCATCHERS, p. 193

aa. Bill very short and broad, gape very deeply cleft, more than twice as long as the bill; outer primary more than twice as long as the innermost. SWALLOWS, p. 250

aaa. Bill with mandibles crossed. CROSSBILLS, p. 223

aaaa. Bill slender or conical (or, if somewhat flattened, plumage with bright tints).
b. No yellow in plumage.
c. Back not streaked, tail not brown narrowly cross-barred with black.
d. General plumage black or with metallic reflections (feathers often edged with buff or rusty in autumn).[1]
e. Whole plumage uniform (except for autumnal edgings).
f. Wing over 10. CROWS, p. 202
ff. Wing under 6. GRACKLES or BLACKBIRDS, p. 207
ee. Head brown. COWBIRD, p. 209
eee. Shoulders red and buff (or white). RED-WINGED BLACKBIRD, p. 210
dd. Back and head black.
e. Belly white. CHEWINK, p. 242
ee. Belly and rump orange. BALTIMORE ORIOLE, p. 214
eee. Belly and rump chestnut. ORCHARD ORIOLE, p. 213
ddd. Back gray or ashy (feathers edged with rusty in Rusty Blackbird).
e. No white on tail.
f. Head and rump with yellow-olive tint. PINE GROSBEAK (female), p. 220
ff. No olive tint.
g. Under parts ashy.
h. Under tail-coverts rufous. CATBIRD, p. 295
hh. Under tail-coverts not rufous.
i. Lighter below than above. COWBIRD (female), p. 209
ii. Uniform above and below. RUSTY BLACKBIRD (female), p. 215
gg. Under parts whitish, throat and cap black. CHICKADEES, p. 305
ee. White spots at the end of outer tail feathers.
f. Under parts rusty red. ROBIN, p. 314
ff. Under parts white or pale gray.
g. Black ear patch. SHRIKES, p. 257
gg. No ear patch.
h. Wing over 4. MOCKINGBIRD, p. 294
hh. Wing under 4. JUNCO, p. 238
f. Under parts narrowly banded with dusky. SHRIKES, p. 257
dddd. Plumage of upper surface bright blue-gray or brilliant blue.
e. Blue-gray.
f. Cap or nape black. NUTHATCHES, p. 303
ff. Cap uniform with back.
g. Throat white. GNATCATCHER, p. 309
gg. Throat black. BLACK-THROATED BLUE WARBLER, p. 274

[1] European Starling glossy black, with purple reflections and round whitish spots (see p. 206).

ee. Bright blue.
f. Wing over 5. BLUE JAY, p. 203
ff. Wing, 3.80–4.15. BLUEBIRD, p. 315
fff. Wing, 3.30–3.60. BLUE GROSBEAK, p. 245
ffff. Wing, 2.60–2.80. INDIGOBIRD, p. 245
ddddd. Plumage with more or less bright red, pink or crimson.
e. Bright red above and below (body sometimes gray in female).
f. Head crested. CARDINAL, p. 243
ff. Head not crested. SUMMER TANAGER, p. 249
ee. Plumage scarlet, wings and tail black. SCARLET TANAGER, p. 248
eee. Under wing-coverts and breast pink. ROSE-BREASTED GROSBEAK, p. 244
eeee. Cap, back and breast suffused with pink or crimson or cap alone crimson.
f. Wing over 4.50. PINE GROSBEAK, p. 220
ff. Wing, 3.15–3.40. PURPLE FINCH, p. 222
fff. Wing under 3. REDPOLL, p. 224
eeeee. Tuft of orange-red on each side of the breast and on wings and tail. REDSTART, p. 291
eeeeee. A spot of red on crown. KINGLETS, p. 307
dddddd. Back brown or olive.
e. Plain below, not streaked.
f. Back brown.
g. A white spot on the edge of the wing. CHEWINK (female), p. 242
gg. No white on wing.
h. A white mark on outer tail feather. PINE WARBLER (young), p. 280
hh. No white on tail.
i. Wing about 3.50. BLUE GROSBEAK (female), p. 245
ii. Wing about 2.50. INDIGOBIRD (female), p. 245
ff. Back olive.
g. Bill slightly hooked at tip. VIREOS, p. 259
gg. Bill not hooked.
h. Crown striped black and buff. WORM-EATING WARBLER, p. 267
hh. Head uniform with back.
i. Two rather dull wing bars.
j. Wing over 2.40. CERULEAN WARBLER, p. 277
jj. Wing under 2.30. RUBY-CROWNED KINGLET, p. 308
ii. No wing bars.
j. A white spot on edge of wing. BLACK-THROATED BLUE WARBLER (female), p. 274
jj. No white on wing. TENNESEE WARBLER, p. 272

ee. Streaked below.
f. Outer tail feathers tipped with white.
TITLARK, p. 293
ff. Tail without white marks.
g. Tail, 5–5.75. BROWN THRASHER, p. 296
gg. Tail, 2–2.50.
OVENBIRD AND WATER THRUSHES, p. 283
ggg. Tail, 2.60–3.30. THRUSHES, p. 310
cc. Back streaked, tail not conspicuously cross-barred.
d. Plumage largely white above; wing, 4.20–4.50.
SNOW BUNTING, p. 227
dd. Tail feathers sharply pointed; wing, 3.70–4.
BOBOLINK, p. 208
ddd. Bill slender.
e. Bill curved; wing, 2.40–2.70.
BROWN CREEPER, p. 302
ee. Bill not curved; wing less than 3.
f. Back blue. CERULEAN WARBLER, p. 277
ff. Back not blue. WARBLERS, p. 263
Sections b^4 *c d* and b^4 c^2 *d*
dddd. Bill conical; "plumage sparrow-like."
SPARROWS, p. 218; section b^8
ccc. Back plain or streaked, tail cross-barred with black. WRENS, p. 297
bb. More or less yellow in the plumage.
c. Wing less than 3.
d. Bill conical, sparrow-like; tail slightly forked.
GOLDFINCH, p. 225
dd. Bill slightly hooked at tip, plain above and below, yellow on breast or flanks only. VIREOS, p. 259
ddd. Bill slender, not sparrow-like, tail not forked.
e. Yellow on crown only, bordered with black, rest of plumage olive or grayish-white.
GOLDEN-CROWNED KINGLET, p. 308
ee. Pattern not as in last.
WARBLERS, p. 264; section *aa*
cc. Wing over 3.
d. Under parts olive-yellow.
e. Throat black. ORCHARD ORIOLE (young), p. 213
ee. Throat uniform with under parts.
f. Wing, 3. ORCHARD ORIOLE (female), p. 213
ff. Wing, 3.50 or over.
g. Olive-green above.
SCARLET TANAGER (female or male in autumn), p. 248
gg. Olive-buff above.
SUMMER TANAGER (female), p. 249
dd. Bright yellow on under parts with black on throat or breast, brown streaked above.
e. Wing over 3.90. MEADOW LARK, p. 212
ee. Wing under 3.30. DICKCISSEL, p. 246
ddd. Under parts dull orange.
BALTIMORE ORIOLE (female), p. 214

dddd. Yellow very much restricted.
e. Restricted to tips of tail feathers and flanks.
WAXWINGS, p. 255
ee. Restricted to top of head and rump, rest gray.
PINE GROSBEAK (female), p. 220
eee. Restricted to throat; breast and lores black.
HORNED LARKS, p. 201

Family TYRANNIDÆ.

THE FLYCATCHERS.

The Tyrant Flycatchers are small or medium sized, usually plain colored birds with rather long wings and small feet. They have the habit of perching on some convenient limb, often at the top of a dead tree, from which they sail out after passing insects, returning again to the same perch. Their bills are very broad and flat, well armed with bristles at the base.

Their vocal apparatus is much less highly organized than in any of the following families, which are separated collectively as the Song Birds.

a. Wing over 4.
b. Under parts white or tinged with gray, tail white tipped.
KINGBIRD, p. 195
bb. Under parts yellowish-white, sides and band across the breast dusky.
OLIVE-SIDED FLYCATCHER, p. 197
bbb. Throat gray, belly yellow. GREAT-CRESTED FLYCATCHER, p. 196
bbbb. Tail, 7–10 long, deeply forked.
FORK-TAILED AND SCISSOR-TAILED FLYCATCHERS, p. 194
aa. Wing under 3.5.
b. Wing over 3.
c. Lower mandible dark. PHOEBE, p. 196
cc. Lower mandible light. WOOD PEWEE, p. 198
bb. Wing under 3.
c. Lower parts sulphur yellow. YELLOW-BELLIED FLYCATCHER, p. 198
cc. Lower parts white, sometimes tinged on breast with pale yellow.
d. Back olive, lower mandible pale. ACADIAN FLYCATCHER, p. 199
dd. Back decidedly brownish, lower mandible dusky.
e. Wing, 2.60 or over. ALDER FLYCATCHER, p. 199
ee. Wing under 2.60. LEAST FLYCATCHER, p. 200

442 Muscivora tyrannus (Linnæus).

Fork-tailed Flycatcher.

Adults.—Length, 12–14. Wing, 4.10–4.75. Tail, 9–10. Above, bluish-gray; head, black, with a central yellow spot; under parts, white; wings, dusky; tail, black, outermost feathers with outer web white for basal half. Both this and the following are remarkable for the very long, forked tail, more than twice the length of the body.

This tropical bird which does not normally come farther north than Southern Mexico and the lesser Antilles, has strangely enough been taken three times in the State of New Jersey. The first was obtained near Bridgeton, in the first week of December, presumably about 1820,[1] and was presented by Mr. J. Woodcraft, of that town, to Titian Peale. The second specimen was shot by Audubon, a few miles below Camden, in the end of June, 1832.[2] The last was taken near Trenton, in autumn, 1900, according to Dr. C. C. Abbott, and was mounted in a store at the corner of Broad and Liberty streets, Trenton.[3]

One cannot but think that these birds might have been caged specimens which escaped from vessels coming up the Delaware.

443 Muscivora forficata (Gmelin).

Scissor-tailed Flycatcher.

Adults.—Length, 12–15. Wing, 4.40–5.15. Tail, 7–10. Head, neck and breast, pale pearl-gray, tinged with buff and pink on the back, passing into black on the upper tail-coverts; a spot of vermilion in the middle of the crown and a tuft of vermilion feathers on each side of the breast; under tail-coverts and base of outer tail feathers, pale salmon-pink; tips of two outer tail feathers and all of the others, black; wings, dusky; coverts and tertials edged with grayish-white.

A very rare straggler from the Southwest (Texas and Mexico). One specimen was obtained by Dr. C. C. Abbott, on Crosswicks meadows, five miles below Trenton, April 15th, 1872, and is now in the Academy of Sciences, Salem, Massachusetts.[4]

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[1] Bonaparte, Amer. Ornith., I., p. 1.
[2] Audubon, Ornith. Biog.
[3] Babson, Birds of Princeton, p. 56.
[4] Amer. Nat. VI., p. 367.

444 Tyrannus tyrannus (Linnæus).

Kingbird.

PLATE 44.

Adults.—Length, 8–9. Wing, 4.50. Above, dark slate color; head, black, with a concealed median spot of orange feathers; wings, dusky; coverts and tertials slightly bordered with white; tail, black, all the feathers broadly tipped with white; under parts, white, slightly tinged with gray on the breast.

Young in first summer.—Similar, but browner above, and concealed crown patch lacking.

Nest of twigs and rootlets, lined with wool, moss, etc., placed in the top of a tree; eggs, three to five, white, with rather coarse spots of brown, .95 x .70.

Common summer resident. Arrives April 29th (May 4th), departs September 20th.

A common bird of the farm and orchard; the Kingbird is familiar to everyone. From his perch on a dead branch at the top of a tree he keeps a watch, as it were, over his domain, and every now and then darts out to catch some passing insect, or to pursue some feathered trespasser who has entered his territory. He attacks all birds alike, without regard to any possible injury that they may inflict upon him or his family. His wonderful agility enables him to make it very uncomfortable for the passing Turkey Vulture or Crow, and I have seen him press a circling Chimney Swift so closely as to drive him to the ground almost paralyzed with fright. As he returns to his post he gives vent to his harsh "see-saw"-like call.

In early spring he likes to perch on the top of some old mullein stalk or weed in the pasture and from this vantage point snap up any passing insects. Occasionally he devours honey bees, but not enough to constitute any damage, while eighty per cent. of his food consists of noxious insects.

447 Tyrannus verticalis Say.

Arkansas Kingbird.

Adults.—Length, 8–9.50. Wing, 4.75–5.25. Pale slaty-gray above, paler on the throat and breast; belly, yellow, with a tinge of the same on the rump; tail-coverts and tail, black; outer web of outermost feathers, white; wings, dusky brown; a concealed red crown patch.

Another straggler from the far West. One specimen was taken by Professor A. H. Phillips at Princeton, September 29th, 1894, which is in his collection.[1]

452 Myiarchus crinitus (Linnæus).

Great Crested Flycatcher.

PLATE 45.

Adults.—Length, 8.50–9. Wing, 4.25. Above, dull olive; feathers on the head with dusky centers; wings with two light bars and light edgings to the tertials; outer webs of primaries, rusty; middle pair of tail feathers and outer webs of the others, olive-brown; inner webs, cinnamon rufous; throat and breast, gray; abdomen, sulphur yellow.

Young in first summer.—Similar, but more tinged with rusty.

Nest in a hollow of a tree trunk or in the end of a broken hollow limb; composed of grass, etc., and almost invariably of pieces of cast snake skin; eggs, three to six, cream colored, streaked with brown, .85 x .65.

Common summer resident. Arrives April 29th (May 4th), departs September 1st.

The loud, harsh cry of this Flycatcher once heard will never be forgotten. It carries far across the woodland, and once back from his winter home, the bird is not slow to announce his arrival. When several Great Crests are chasing each other through the woods the racket is really startling. They are not always woodland birds, but frequently nest in old apple trees in the orchard, and become quite familiar, giving us a good view of their fine erectile crest and distinctive coloring. Besides the harsh cry, usually repeated rapidly several times, they have a more plaintive single call that I have frequently heard about dusk from a bird that had established a roosting place in a thick maple near our porch.

456 Sayornis phœbe (Latham).

Phœbe.

Adults.—Length, 6.25–7. Wing, 3.30. Above, grayish olive-brown; wings and tail more dusky; top and sides of head, sooty brown; under parts, dull white, much yellower in autumn.

[1] Stone, Birds of E. Pa. and N. J., p. 152.

Young in first summer.—Similar, but wing-coverts tipped with buff, forming two bars, and upper tail-coverts tinged with cinnamon.

Nest of mud and moss, lined with grass, etc., placed under the eaves of a spring house, boat house or barn, or under a bridge or upturned stump; eggs, four to six, white, .75 x .55.

Common summer resident. Arrives March 13th (March 21st), departs October 25th.

One was seen by Dr. William C. Braislin at Crosswicks, Mercer county, December 26th, 1894.[1]

The Phœbe is one of our true home birds, and one that we look for with interest as a real herald of springtime. He perches familiarly on the fence, on old weed stalks, or about the farm buildings, incessantly flirting his tail and giving vent to the well-known "phœ'be, phœ'be, phœ'be."

459 Nuttallornis borealis (Swainson).

Olive-sided Flycatcher.

Adults.—Length, 7.75. Wing, 4. Above, dark smoky gray; wings and tail, blacker; tertials slightly edged with whitish; under parts, white, sometimes faintly tinged with yellow; breast, except a median line, and flanks, ashy brown, distinctly streaked with dusky.

Rare transient. May and August—September. Mr. Chapman regards it as not uncommon, in autumn, near New York.[2] It is rare at Demarest (Bowdish), and one is recorded from Morristown, September 18th, 1885, by Thurber and Greene.[3] Mr. Scott saw only one at Princeton,[4] and for south Jersey we have no record, although Krider[5] states that he has taken it.

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[1] Abst. Proc. Linn. Soc., N. Y., VII., p. 9.
[2] Birds Vicinity N. Y., p. 53.
[3] O. and O., XI., p. 92.
[4] Babson, Birds of Princeton, p. 57.
[5] Field Notes, p. 24.

461 Myiochanes virens (Linnæus).

Wood Pewee.

PLATE 44.

Adults.—Length, 6–6.50. Wing, 3.25. Above, plain olive-brown; wings and tail, dusky; slight whitish edgings to wing-coverts and tertials; under parts, grayish-white, tinged with olive-gray on the breast, and a very faint wash of yellow on the abdomen.

Young in first summer.—Similar, but with conspicuous buff wing bars and a buff tinge on the rump.

Nest on the horizontal limb of a tree, covered externally with lichens lined with fine grass, etc.; eggs, three to four, creamy white, with a circle of dark brown spots at the larger end, .80 x .55.

Common summer resident. Arrives May 3d (May 9th), departs September 20th.

The Wood Pewee is a familiar summer resident of the orchard and woodland, and throughout the day his plaintive drawling "pee—wee" may be heard, contrasting strangely with the sharp emphatic cry of the Phœbe. He is wholly insectivorous, sailing out from his perch on some dead limb to catch his prey on the wing.

463 Empidonax flaviventris Baird.

Yellow-bellied Flycatcher.

Adults.—Length, 5.75. Wing, 2.50–2.75. Above, plain greenish-olive; wings, dull black, with two conspicuous yellowish bars, and edgings of the same on the tertials; under parts, pale yellow; breast shaded with olive.

Tolerably common transient. Spring, May 17th to 20th; autumn, September 4th to 25th.

Best told from the related species by the much more yellow and olive under surface. It is only a passing visitor in New Jersey and usually silent while with us.

465 Empidonax virescens (Vieillot).

Acadian Flycatcher.

Adults.—Length, 5.50. Wing, 2.75. Grayish olive-green above; wings and tail, brownish; two buff or whitish wing bars and similar edgings to the tertials; under parts, pale yellowish-white, shaded with olive on the breast.

Young in first summer.—Similar, but feathers of the upper parts edged with buff and wing bands strongly buff.

Nest on a slender fork near the end of a horizontal limb, made largely of oak or chestnut catkins, mixed with vegetable fibers; eggs, two to three, creamy-white, with a few reddish spots at the larger end, .75 x .55.

Common summer resident, except in the most northern counties. Common in the lower Hudson valley, rare at Plainfield (Miller), rather uncommon at Princeton (Babson), but regular at Newton, Sussex county (Philipp). Arrives May 5th, departs September 15th.

This is the breeding little green Flycatcher of the southern half of New Jersey, though it overlaps the range of the Least Flycatcher across the middle of the State, both species breeding at Trenton (Stone) and at Plainfield (Miller).

The Acadian Flycatcher is a bird of the woodland usually near some little brook, though its nest is often swung out over the water of a larger stream. It has a single call, repeated at regular intervals, as the bird sits upon its perch, or occasionally sails out in pursuit of a passing insect.

466a Empidonax traillii alnorum Brewster.

Alder Flycatcher.

Adults.—Length, 6. Wing, 2.75. Above, brownish-olive; wings and tail, dusky; two deep buff wing bars and dull whitish edgings to the tertials; under parts, white, tinged with light yellow posteriorly; breast shaded strongly with olive-gray.

Young in first summer.—Similar, but browner above, and wing bars darker.

Nest of grass and vegetable fibers in an upright crotch of a bush near the ground; eggs, three to four, white, spotted with rusty brown at the larger end, .70 x .54.

Rare transient, breeding locally in the northern half of the State.

This little Flycatcher is a denizen of open swamps covered with alder bushes, among the branches of which it searches for its insect food, uttering now and then the distinctive cry which Dr. Dwight has so admirably represented by the syllables "ee-zee-e-up." The same

sort of localities seem to be affected by this bird during migration as in the nesting season, and this is perhaps one of the best clues to its identity, as none of its three close relatives are likely to occur in alder swamps. Until comparatively recently, the Alder Flycatcher was not known to nest in the State, though Mr. Rhoads found them at Lake Hopatcong[1] late in May, and was suspicious of their status in that locality. Later, in 1899 to 1902, Mr. W. D. W. Miller[2] found them breeding regularly in the vicinity of Plainfield. Mr. Rhoads also saw them at Alpine in June, 1901,[3] Greenwood and Wawayanda Lakes, June 4th-8th, 1909, and has noted them as rare transients at Haddonfield. Mr. W. E. D. Scott regarded the species as a regular transient at Princeton in the seventies.[4]

467 **Empidonax minimus** Baird.

Least Flycatcher.

Adults.—Length, 5–5.50. Wing, 2.25–2.50. Above, brownish-olive; two dull white wing bars and tertials edged with the same; under parts, white; very pale yellow posteriorly; breast shaded with olive-gray.

Young in first summer.—Browner above, and wing bands darker.

Nest in the upright fork of a branch constructed of vegetable fibers, fine bark, etc.; eggs, three to five, white, .65 x .50.

Common transient visitant in southern New Jersey; summer resident in the northern counties, south to Plainfield (Miller) and Princeton (Babson), and rarely near Haddonfield, where they were found by Mr. S. N. Rhoads in June and July, 1881.[5] Arrives April 28th (May 2d), departs September 15th.

This is one of the four little green Flycatchers whose identification is always a matter of difficulty to the beginner. It is commonly found in the trees about the house and orchard. Its habits are like those of the other Flycatchers, its note a sharp emphatic "chebec," though it occasionally indulges in a sort of flight song of rather more elaborate character. Mr. S. N. Rhoads on one or two occasions has found the Least Flycatcher in summer near Haddonfield, which is its most southern breeding locality. From Trenton and the Raritan northwards it is a regular summer resident.

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[1] Birds of E. Pa. and N. J., p. 101.
[2] Auk, 1901, p. 108; 1903, p. 68.
[3] Cassinia, 1901, p. 50.
[4] Babson, Birds of Princeton, p. 57.
[5] Bull. Nutt. Orn. Club, 1882, p. 55.

Family ALAUDIDÆ.

The Larks.

These birds are poorly represented in America. All our forms, of which two occur in the State, seem to be sub-species of one widely-distributed species. The European Skylark has been liberated about New York, and at least one attempt was made to introduce them in New Jersey. Larks are terrestrial birds with a very large hind claw.

473 Alauda arvensis Linnæus.

European Skylark.

In the Ornithologist and Oologist, 1884, p. 11, it is stated that eighty-four European Skylarks were liberated on a farm in New Jersey, in 1882, and that some were still to be seen there.

Mr. "William J. Sherratt" [= William J. Rogers] states in the same journal for 1884, p. 24, that several European Skylarks were seen during the summer of 1883, along the Camden and Atlantic railroad, below Winslow Junction. Skylarks have been introduced in small numbers on Long Island, but have not increased.

474 Otocoris alpestris (Linnæus).

Horned Lark, Shore Lark.

PLATE 46.

Adult male.—Length, 7.50–8. Wing, 4–4.50. Upper parts vinaceous, more or less washed and streaked with brown; rump and shoulders brighter; a line along each side of the crown, including some elongated erectile feathers, black; forehead and line over the eye, pale yellowish; a broad black stripe from the base of the bill down the side of the throat, and a triangular breast patch, black; whole throat and ear region, pale yellow; abdomen, white; sides, vinaceous; hind part of breast streaked with dusky; middle tail feathers, vinaceous; others black, outer ones edged with white. In winter, when the birds are with us, the black areas are all veiled with whitish edgings.

Adult female.—Similar, but duller.

Common winter visitant in large flocks along the coast, and less frequent inland.

When feeding in old sandy fields these birds are scarcely distinguishable, so closely does their coloring resemble their surroundings. The whole flock takes flight together, with low "peents," and sails about close to the ground, soon coming to rest again.

When walking about, the erectile feathers behind the eye, which give the bird its name of Horned Lark, may often be seen elevated.

In the interior of the State we usually associate these birds with a heavy fall of snow, as they frequently appear simultaneously with a storm or blizzard, doubtless traveling from feeding grounds that have been buried under the white mantle.

474b Otocoris alpestris praticola Henshaw.

Prairie Horned Lark.

Adults.—Length, 7–7.50; female, 6.75. Wing, 3.75–4.25. Similar to the preceding but smaller, less streaked above, and with the yellow areas almost entirely white.

Irregular winter visitant.

This race of Horned Lark, which nests in northern Pennsylvania and probably Long Island, may possibly occur as a summer resident in northern New Jersey. It often associates with the preceding in the winter flocks, but is by no means so abundant. Mr. L. K. Holmes has reported it at Summit and Mr. W. D. Miller at Plainfield.

Family CORVIDÆ.

The Crows.

This family comprises the Crows and Jays, of which four species occur in the State. They are large or medium sized birds, with powerful bills and strong feet. Their food is varied.

a. Plumage glossy black.
  b. Wing over 15. — Raven, p. 204
  bb. Wing, 12–13. — Crow, p. 205
  bbb. Wing under 12. — Fish Crow, p. 206
b. Plumage blue above, marked with black and white; head crested. — Blue Jay, p. 203

477 Cyanocitta cristata (Linnæus).

Blue Jay.

PLATE 47.

Adults.—Length, 11–12.50. Wing, 5–5.75. Above, grayish-blue; head strongly crested; forehead, black; a black band across the base of the crest behind and down the sides of the neck and across the breast, where it becomes wider; wings and tail, bright blue; secondaries and greater-coverts barred with black and broadly tipped with white; tail feathers barred with black (except the outer pair), and all but the middle pair broadly tipped with white; under parts, grayish-white, except the black breast band.

Young in first summer.—Grayer and with little or no crest.

Nest a large, compact structure of fine rootlets; eggs, four to six, dark olive blotched with brown, 1.10 x .80.

Resident, but most plentiful during autumn.

This splendid bird is by no means so conspicuous an object as one might suppose. His bright colors are all on his back, and by keeping pretty much to the tree tops and keeping a sharp lookout for intruders, he generally manages to give us only a distant view, when we are forced to fall back upon his rounded, white-tipped tail, his mode of flight and his harsh "jay, jay" for purposes of identification.

Besides his usual cry he has a mellow, flute-like whistle and more rarely other notes.

The food of the Jay consists of one-quarter animal matter (insects mainly) and three-quarters vegetable. His preferences seem to be for acorns, chestnuts, beech nuts, etc. While universally charged with robbing the nests of smaller birds, the investigation of the United States Department of Agriculture seems to show that the Jay is not as bad as is generally supposed, though not guiltless. Like Crows, Jays delight in mobbing any unfortunate owl which they may discover blinking on his perch. In captivity they prove very interesting pets.

486a Corvus corax principalis Ridgway.

Raven.

Adults.—Length, 21.50–26. Wing, 15.50–18. Everywhere black with bluish reflections; feathers of the throat elongated and narrow.

Young in first summer.—Body plumage dull brownish-black.

Nest a bulky structure of sticks lined with bark, fibers, etc., situated in the top of a tall tree (or cliff in other localities); eggs, four to seven, bluish-green, or olive spotted with brown or dark olive, 1.95 x 1.25.

Formerly rare resident. A few may still breed in the State.

The Raven is a bird of the wildest sections of the country, disappearing as civilization advances. They are seen singly or in pairs, and in general appearance resemble crows. The distinguishing points as we see the bird in flight are (1) the larger size—not always an easy thing to judge, since distance, atmosphere, etc., play an important part in estimating the bulk of a bird; (2) the hoarse guttural croak; (3) the more frequent sailing.

In New Jersey the Ravens are restricted mainly to the wilderness known as the Pine Barrens and to the seashore. In winter and early spring I used frequently to see a pair crossing the salt meadows below Atlantic City from the pine lands, apparently to feed along the beach, and in 1892 and 1893 Mr. S. N. Rhoads and I saw a pair near May's Landing, which were said to nest in the vicinity.[1]

Mr. Jillson, of Tuckerton, informs me that a pair bred regularly a few miles inland from that point, returning to the same nest year after year, but in 1905 the wood where they nested was cut down. Ravens have, however, been seen in the vicinity in subsequent years. Mr. George B. Benners writes me that he obtained two young Ravens, just able to fly, from a nest in a gum tree, in a swamp between West Creek and Tuckerton, May 1889, and Mr. W. E. D. Scott[2] secured a specimen at West Creek, January 17th, 1879.[1]

Beesley mentions them as occurring in Cape May county in 1857, but he did not know of their nesting. Thurber records one shot at Morristown by L. P. Sherer about 1881.

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[1] Birds of E. Pa. and N. J., p. 103.

[2] Bull. Nutt. Orn. Club, 1879, p. 82.

488 Corvus brachyrhynchos Brehm.

Crow.

PLATE 48.

Adults.—Length, 17–21. Wing, 12–13. Everywhere black with blue or purplish reflections; abdomen duller.

Young in first summer.— Body plumage, dull brownish-black.

Nest a bulky structure of twigs lined with cowhair, bark, grass, etc., generally placed in the top of a chestnut or oak tree; eggs, green, blotched with brown, 1.60 x 1.15.

Abundant resident.

In summer Crows are scattered over our woodland in pairs, but toward winter they begin to gather into the great flocks which are so characteristic of midwinter in southern Jersey. Evening and morning they may be seen winging their way to and from their roosting places, which are definite sections of woodland that have been in use for generations.

Roosts now in use are located at Merchantville, Camden county; Fishing Creek, Cape May county; below Salem, Salem county; Alloway, Salem county, and Ash Swamp, Union county. Doubtless there are others, but all of them seem to be decreasing in population, and possibly the Crows are being driven by persecution to break up into much smaller roosting communities than formerly.

From an economic standpoint much has been written about the Crow, with the result that he seems to stand literally on the fence. Twenty-three per cent. of his food consists of insects, the bulk of them noxious species. On the other hand, he annually devours a considerable quantity of corn, causing the farmer much trouble and vexation.

All things considered, it would seem that scarecrows and other methods of frightening the crows from the crops would be preferable to attempted extermination.

As pets, Crows are amusing and intelligent.

Much has been written about Crows and their roosts.[1]

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[1] *Cf.* S. N. Rhoads, Amer. Nat., 1886, pp. 691 and 777; E. Martin, Oologist, IV., 1887, p. 94; W. T. Davis, Auk, 1894, pp. 228–231; W. Stone, Bird Lore, 1899, pp. 177–180; Auk, 1903, pp. 267–271; H. L. Coggins, Cassinia, 1903, pp. 29–42; C. J. Hunt, Auk, 1906, p. 429; also Prof. W. B. Barrows, The Common Crow of the U. S.; Bull. 6, U. S. Dept. Agr. Div. Orn. and Mam.

489 Corvus ossifragus Wilson.

Fish Crow.

Adults.—Length, 15–17. Wing, 10.25–11.25. Everywhere black with bluish reflections above, and a greenish gloss below, where the plumage does not become duller as in the Common Crow; the back is also more uniformly glossy, and is not broken by duller tips to the feathers.

Young in first summer.—Duller; body plumage, brownish-black.

Nest usually in a pitch pine tree; eggs, four to six, similar to those of the American Crow, but rather smaller, 1.45 x 1.05.

Resident along the coast and lower Delaware River.

According to Zarega,[1] they occur regularly north to Seabright, and less so to Sandy Hook. Mr. Babson states that they nest occasionally at Princeton.[2]

While clearly distinct from the Common Crow when in the hand, the Fish Crow is by no means so readily distinguished in life. Unless they are seen together the difference in size is not very appreciable, but the call is quite different, the "caw" of the Fish Crow being much weaker, with a nasal quality, "as if the bird had a cold in the head."

The Fish Crow occurs only along the seacoast and up the Delaware River, breeding throughout its range, usually in colonies. Typical nesting communities occur on the island beaches, which support a growth of trees, and where the summer resorts and their visitors have not frightened the birds away.[3]

Family STURNIDÆ.

The Starlings.

493 Sturnus vulgaris Linnæus.

European Starling.

Adult male.—Length, 8.50. Wing, 5.10. Glossy black with purple and green reflections, spotted above with white or buff; bill, yellow, very sharp pointed.

Female.—Spotted below as well as above.

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[1] Bull. Nutt. Orn. Club, 1880, p. 205.

[2] Birds of Princeton, p. 59.

[3] *Cf.* also for nesting on the N. J. coast; Burns, Oologist, 1893, p. 310; Crispin, Oologist, 1901, p. 106; Shick, Auk, 1890, p. 328.

Young in first summer.—Ashy brown, without spots.

Nest in holes about buildings or hollow trees, constructed of grass, twigs, etc.; eggs, five, pale greenish-blue, 1.15 x .85.

According to Mr. F. M. Chapman, eighty Starlings were liberated by Mr. Eugene Schuffelin, in Central Park, New York, on March 6th, 1890, and forty more on April 25th, 1891. By 1894 they had spread beyond the park limits, and by 1906 had reached Red Bank and Princeton, New Jersey.[1] At the present time they have spread down the coast to Tuckerton, in the interior as far as Vineland, and down the Delaware to Philadelphia, with one record for the State of Delaware.[2] As soon as it became apparent that the Starlings had obtained a footing in New York, the United States government prohibited their further importation, but too late to stop their spread. They have many of the undesirable qualities of the English Sparrow, and will, it is feared, drive away many of our native birds.

Family ICTERIDÆ.

THE ORIOLES, BLACKBIRDS, ETC.

The members of this family are peculiar in having the culmen run well up on the forehead, dividing the frontal feathers.

a. Abdomen streaked all over with black and white (or buff).
RED-WING BLACKBIRD (female), p. 210

aa. Abdomen not streaked.

b. Under parts black (sometimes edged with buff in autumn).

c. Wing, 5.75 or over. GRACKLES, pp. 215–217

cc. Wing under 5.

d. Shoulder red and buffy-white, otherwise black.
RED-WING BLACKBIRD (male), p. 210

dd. Hind collar buff, rump white, otherwise black.
BOBOLINK (male), p. 208

ddd. Head brown, rest of plumage blue-black.
COWBIRD (male), p. 209

dddd. Head yellow, rest of plumage black.
YELLOW-HEADED BLACKBIRD, p. 210

ddddd. Entirely blue-black (edged with rusty in autumn).
RUSTY BLACKBIRD, p. 215

[1] Birds of N. Y. and Vicinity, p. 164.

[2] Stone, Auk, 1908, p. 221. *Cf.* Babson, Bird Lore, 1907, p. 209.

bb. Under parts gray or plumbeous.
c. Lighter below than above, bill short and thick.
COWBIRD (female), p. 209
cc. Uniform above and below (edged with rusty in autumn), bill more slender. RUSTY BLACKBIRD (female), p. 215
bbb. Under parts not uniform black or gray.
c. Throat black.
d. Belly chestnut. ORCHARD ORIOLE, p. 213
dd. Belly orange. BALTIMORE ORIOLE, p. 214
ddd. Belly olive-yellow. ORCHARD ORIOLE (young), p. 213
cc. Throat not black.
d. A black crescent or a necklace of spots across the breast, belly yellow. MEADOW LARK, p. 212
dd. Buff below, streaked on the sides with brown or black.
BOBOLINK (female and autumnal male), p. 208
ddd. Uniform pale orange below.
BALTIMORE ORIOLE (female), p. 214
dddd. Uniform olive-yellow. ORCHARD ORIOLE (female), p. 213

494 **Dolichonyx oryzivorus** (Linnæus).

Bobolink, Reedbird.

PLATE 49.

Adult male in spring and summer.—Length, 6.50–7.50. Wing, 3.75. Head all around and entire under parts, black, sometimes with buff edgings to feathers; back of neck in broad half collar, buff; back, black, streaked with buff; scapulars, rump and upper tail-coverts, white, more or less shaded with gray; tail, black; wings, black; flight feathers edged with buff.

In autumn.—Above, light buffy-olive, two broad blackish stripes on the crown; feathers of the back largely black, the buff edgings forming two longitudinal stripes; wings edged with buff; under parts, buff, deepest on the breast; flanks heavily streaked with black, often a few black feathers on the throat and breast.

Adult female.—Similar to autumnal male, but never showing black feathers below.

Young in first summer.—Feathers of the upper surface black, broadly edged with buff; head, black, with a median buff stripe; hind neck entirely buff; under parts, pale buff.

Nest of grass, situated on the ground and well concealed; eggs, four to six, grayish-white, spotted irregularly with brown, .84 x .62.

Common transient visitant; summer resident from Princeton and Plainfield, northward, but locally distributed. Arrives May 2d (May 8th), departs September 20th.

What a pity that such a splendid bird as this cannot be protected and perpetuated! Its song is one of the wonders of our bird music,

and the wild chorus of these black and white songsters, as they sweep over our fields on their way northward, defies description.

Apparently they originally nested farther south than they do now; certainly they nested everywhere more abundantly, but the slaughter to which they are subjected on their return flight in the autumn, when in the somber Reedbird plumage, they are shot down by so-called "Sportsmen," is rapidly thinning their ranks.

They are adepts in concealing their nests and one may search for hours, constantly attended by the male on fluttering wings, apparently full of anxiety and certainly full of melody, only to find that the nest is really far away in another field.

495 Molothrus ater (Boddært).

Cowbird.

Adult male.—Length, 7.75–8.25. Wing, 4.50. Entire head, neck and chest, dark brown or drab; rest of plumage, glossy black, with greenish reflections.

Adult female.—Above, brownish-gray, with a slight iridescence on the feathers of the back; below, paler brownish-gray, with darker shaft lines on many of the feathers.

Young in first summer.—Above, grayish-brown, all the feathers with buff edgings; below, dull white, tinged with buff and streaked with dusky, except on the throat.

Builds no nest, but deposits its eggs in the nests of other birds; eggs, white, thickly and minutely speckled with brown, .85 x .64.

Common summer resident, occasional in winter—Cape May (Stone[1] and Hand), Yardville (Allinson), Plainfield (Miller).[2] Arrives March 15th (March 25th), bulk departs in October. Some linger till December 1st, at Princeton (Babson).[3]

Small bunches of these birds reach us early in the spring, and the males may be seen perched in some tree on the edge of the swamp spreading their wings and tail, and literally forcing out the guttural creaking sounds that pass with them for a song. Later we see the females skulking about searching for the nests of the Warblers, Sparrows and Vireos, in which they usually deposit their eggs. And later still, in small flocks, they may be seen following the cattle in the field.

[1] Auk, 1892, p. 204.
[2] Osprey, II., p. 91.
[3] Birds of Princeton, p. 59.

They consume a greater portion of grain than the Red-wing, but apparently most of it picked up from the droppings of cattle and about the barnyards.

In winter I have found them in Cape May county associating with Red-wings.

497 Xanthocephalus xanthocephalus (Bonaparte).

Yellow-headed Blackbird.

Adult male.—Length, 10. Wing, 5.50. Black with the head and breast bright yellow, except a black spot before the eye and on the chin; outer wing-coverts, white.

Female.—General color brownish; forehead, line over the eye and breast, dull yellow, with more or less white below.

An accidental straggler from the west.

An immature specimen, secured by a gunner at Tuckerton about 1890, is in the collection of the Academy of Natural Sciences, Philadelphia.

This is apparently the only record for the State.[1]

498 Agelaius phœniceus (Linnæus).

Red-winged Blackbird.

PLATE 50.

Adult male in summer.—Length, 9–10. Wing, 4.75. Uniform black, except the shoulder patch, which is vermilion or scarlet, bordered with buff. In autumn the feathers of the upper part are bordered with rusty brown edgings, those of the lower parts slightly with buff.

Adult female.—Length, 7.50–8.50. Above, dull blackish-brown, streaked with buffy; below, broadly streaked blackish and buffy-white; throat suffused with pale pink; shoulders tinged with dull red. In winter broadly edged with rusty and buff above.

Young male in first autumn.—Similar to the adult male, but heavily veiled with rusty and buff; shoulder patch mottled with black.

Young in first summer.—Similar to adult female, but more yellowish-buff below and streaks narrower.

Nest of grass situated in a tussock or supported upon cattail stalks or in low bushes, usually close to the water; eggs, three to five, pale bluish-gray, spotted and "pen marked" with black about the larger end, 1.00 x .70.

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[1] Abst. Proc. D. V. O. C., II., p. 14, where the locality is inadvertently given as Fish-House.

Abundant summer resident. Arrives March 3d (March 10th), departs November 10th. Occasional in winter, usually in the southernmost part of the State. Wildwood, December 27th, 1903 (W. L. Baily);[1] Leonia, December, 1906 (C. H. Rogers).[1] At Princeton and on the Delaware marshes at Philadelphia they often remain until December 1st.

Upland, open swamps and low wet pasture fields, or the large cattail swamps of our coast and rivers are equally acceptable as breeding grounds for the Red-wings. They assemble sometimes in large colonies; the males with their flaming shoulder patches, ever alert, sail out on the approach of an intruder, and hovering directly over his head keep up an incessant harsh calling. Upon his retirement each returns to his perch on tree-top or fence post and sounds his encouragement to the setting female—the resonant "conquor—eee"—which we may also hear floating up from the border of the swamp as the dusk of evening settles down.

In late summer and autumn the birds gather in flocks repairing to roosts every night, often associating with Grackles, Robins and Cowbirds, and later the two sexes flock separately, remaining apart until the mating season in April.

The Red-wings are among the first migrants of spring time, and the flocks of females always arrive somewhat later than the males. In winter occasional flocks are to be found in Cape May county and along the shores of the Delaware at least as far north as Philadelphia, but they drift up and down and are probably not permanently resident at any one spot.

The Red-wing is one of the few of our smaller birds against which the farmer entertains an hereditary enmity. I have found few farmers who could furnish reliable information concerning the damage caused by these birds in the State, but because Blackbirds and Crows have always been under the ban they are against them.

Let us see what the careful stomach analyses of the Agricultural Department have shown. In the first place, seventy-three per cent. of the Red-wing's food is vegetable and twenty-seven per cent. animal; the latter includes five per cent. grasshoppers and six per cent. caterpillars. Of vegetable matter, grain constitutes fourteen per cent. of the seventy-three per cent., the remainder consisting of various weed and wild grass seed and a small number of wild berries.

The damage done varies greatly in different sections; in most parts

[1] Bird Lore, Christmas Lists, 1904 and 1907.

of the East it is exceeded by the good done by the birds in destroying insects. Extermination of these birds is very undesirable, and indeed hopeless, as far as ordinary methods are concerned, and as the best method for protecting grain, it is suggested to thoroughly tar the seed when planting, and to adopt methods for frightening the birds off during the period of sprouting and early growth.

501 Sturnella magna (Linnæus).

Meadow Lark.

PLATE 51.

Adult male.—Length, 10.75. Wing, 4.50–5. Feathers of upper parts dusky, broadly margined with rusty brown and buff; head, black, with a median pale buff stripe and a similar one over the eye, becoming bright yellow in front; a black stripe behind the eye; sides of face, whitish; wing and middle tail feathers, grayish-brown, with a series of transverse black bars, more or less connected down the shaft; three outer tail feathers largely white, next one with a white stripe; lower parts, bright yellow, with a crescent-shaped black patch on the breast joining a small triangular spot on each side of the throat; sides of breast heavily streaked with black; flanks and crissum, pale buff, streaked with dusky. *In winter*, similar, but all the feathers broadly edged with brown or deep buff, obscuring the markings and making the under parts darker.

Adult female.—Similar, but smaller. Wing, 4.

Young in first summer.—Similar to adult above; below, very pale yellow; breast and sides, buff, streaked with dull black.

Nest on the ground among the grass, generally arched over, composed of dry grass; eggs, four to six, white, spotted with reddish-brown, 1.10 x .80.

Abundant resident, but less common in the northern part of the State in winter, during which season it frequents the low flats along rivers and seashore. Migrants return to the upland about March 8th.

The Meadow Lark is one of the most characteristic birds of the open field. Always on the alert, it seldom allows a very close approach, but takes wing, and with alternate sailing and rapid fluttering of the wings goes on ahead to a place of safety. Its white lateral tail feathers and the single harsh note as it takes wing are characteristic, while the well-known song resembling somewhat the syllables "can't see me" is familiar to everyone.

Although an eminently terrestrial species, the Meadow Lark occasionally perches in the tree-tops, especially in the mating season, when one bird is pursuing another, and also in winter, when the snow has buried the feeding grounds.

In midwinter, in the southern counties of the State, the Larks gather in considerable flocks, and in the flat stretches about Salem I have seen flocks that numbered at least two hundred individuals. The Meadow Lark is one of the most valuable birds to the farmer. Three-quarters of its food consists of insects, and during the late summer it feeds mainly upon grasshoppers. The United States Department of Agriculture estimates that twenty Meadow Larks consume one thousand grasshoppers a day during the season. A grasshopper consumes an amount of grass equal to its own weight each day, so that the amount consumed by one thousand would be about two and a quarter pounds per day, or in the usual life of a grasshopper, which is about thirty days, the amount of grass consumed would be sixty-six pounds, which is the amount saved to the farmer each day by the twenty Meadow Larks.

A curious specimen, in which the yellow is entirely replaced by black, was secured at Haddonfield and presented to the Philadelphia Academy, by B. B. Willis, October 6th, 1857.

506 Icterus spurius (Linnæus).

Orchard Oriole.

PLATE.

Adult male.—Length, 6–7. Wing, 3. Head, neck, back and scapulars, uniform black; tail, black; wings, black, with pale buff edgings; shoulders, as well as rump and under surface of body, rich chestnut.

Adult female.—Yellowish olive-green above; canary yellow below; wings dusky, with two whitish wing bars and whitish edgings to tertials.

Young in first summer and autumn.—Similar to adult female.

Male in first breeding season.—Similar to adult female, but with entire throat and lores black, often with more or less chestnut feathers below and black ones above, and with some black on the tail.

Nest a pocket-like structure of dry grass hung from the end of a tree limb; eggs, three to five, grayish-white, blotched or irregularly streaked with black and brown, .80 x .55.

Common summer resident. Arrives May 1st (May 5th), departs September 1st.

The Orchard Oriole is a bird of the garden and orchard, seldom found out in the woodland, except after the nesting season is over, when parties of old and young may be found in various localities.

Throughout the early summer the varied warbling song may be heard constantly from the tops of the apple trees, or from the evergreens about the lawn, while the performer manages to keep himself well concealed.

This Oriole seems to be more common in the southern half of the State, while the Baltimore is certainly more common in the northern counties.

507 Icterus galbula (Linnæus).

Baltimore Oriole.

PLATE 52.

Adult male.—Length, 7–8. Wing, 3.75. Entire head, throat and upper parts, except the rump, black; rump and lower parts, bright orange; lesser and middle wing-coverts, orange; greater-coverts broadly tipped and tertials edged with white; three outer tail feathers yellow on the terminal half, next feather with a yellow spot.

Adult female.—Above, dull yellow-olive, brightest on the tail; wings, dusky, with two white wing bars and white tips to the tertials; lower parts, dull orange yellow, paler on the abdomen. Occasionally there is some trace of black on the head, throat and tail.

Young in first autumn.—Similar to adult female, but never showing any black.

Young in first summer.—Dull grayish-olive above, brighter on tail; wing bars and tips, gray; below, pale grayish-olive.

Males in first breeding season retain the dusky primaries and many of them the uniform yellow-olive tail feathers of the first autumn dress, while the middle of the abdomen is dull yellow.

Nest long and pocket-like, woven of string, horsehair, shreds of bark and plant fiber; eggs, four to six, grayish-white, with irregular "pen lines" of black and brown, .90 x .60.

Common summer resident, except in the Pine Barrens and the southern counties, where it is mainly or wholly a transient. Arrives May 1st (May 5th), departs September 1st.

Like the Orchard Oriole, the present species is a home bird, always about our houses, nesting in the shade trees, especially in the weeping willows and buttonwoods. The rollicking song is quite as pleasing as that of the other species, while the brilliant orange and black of his plumage renders the Baltimore Oriole one of our most welcome neighbors. His utility is also noteworthy, as over eighty per cent. of his food consists of insects, largely caterpillars, for which he searches diligently in the tree-tops.

509 Euphagus carolinus (Müller).

Rusty Blackbird.

Adult male.—Length, 8.25–9.75. Wing, 4.50. Uniform glossy black with bluish-green reflections, becoming slightly violet on the head, sometimes with traces of buff edges to the feathers. In autumn the upper parts are heavily veiled with rusty brown edgings, the lower parts with buff or cinnamon.

Adult female.—Uniform slaty-gray, slightly glossed with green above. In the autumn veiled with rusty brown and cinnamon as in the male.

Common transient visitant, especially along the large river valleys, and occasional in winter—Morristown (Caskey), Moorestown (Evans),[1] Plainfield (Miller),[2] Princeton (Babson).[3] Spring, March 12th to April 15th; autumn, October.

The Rusty Blackbird is only with us for a short time in spring and fall; frequenting open, wet meadows and thickets, especially along the tide-water creeks. It usually associates in small flocks, but also occurs singly, and sometimes a solitary individual may be seen in a flock of Sparrows on the river meadows in midwinter. Even as far north as Englewood Mr. Chapman has found them wintering.[4]

In spring we occasionally hear the "song" of the male, a curious combination of whistles and harsh notes resembling the creaking of a rusty hinge. The plain dull color, square tail and yellow eye will aid in identifying this species.

511 Quiscalus quiscula (Linnæus).

Purple Grackle, Crow Blackbird.

PLATE 53.

Adult male.—Length, 12–13.50. Wing, 5.75. Plumage, iridescent; head, neck and chest, metallic reddish-violet, bluish or golden green, or a mingling of all three; rest of body, metallic purple, blue or green; rump with bars of various shades of iridescence; under parts, duller.

Adult female.—Length, 11–11.50. Wing, 5. Very much duller, metallic colors much suppressed.

Young in first summer.—Uniform sooty black, with no iridescence, somewhat paler beneath.

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[1] Cassinia, 1903, p. 72.
[2] Auk, 1889, p. 303.
[3] Birds of Princeton, p. 60.
[4] Auk, 1889, p. 303.

Nest large and well built of grass and mud; usually associated in colonies in evergreen trees or orchards close to farm houses; eggs, three to five, bluish-green, irregularly spotted and scrawled with brown or black, 1.10 x .80.

Abundant summer resident. Arrives February 22d (March 14th), departs November 10th. Occasional in winter. Cape May (Spaeth),[1] Princeton (Babson),[2] Montclair, Passaic and Moorestown.[3]

The Grackle is our first migrant, arriving almost invariably about the middle or end of February. The flock soon takes possession of the trees in which their last year's nests were built, and their harsh explosive cries, attended by a curious contortion of the body, form one of the familiar sounds of spring.

Later the whole colony is a scene of great activity as the parents pass to and fro carrying in food and removing excreta from the nests. Then all depart and flock about the woodland, retiring at night to the roosts which are occupied year after year. The commotion and noise about these roosts, as the thousands of birds come in at dusk, is almost deafening and at a distance resembles the escape of steam from some giant engine.

As to the food of the Grackles the record of Professor Beal shows twenty-seven per cent. insects and seventy per cent. vegetable matter. Of the insects nearly half are grasshoppers and caterpillars. Of the vegetable diet over one-half consists of corn. Curiously enough, however, less complaint has been made of this bird than of the Red-wing, the reason being that a large part of the grain eaten is scattered kernels. Where the birds do most damage is where they are overcrowded in a limited area, and measures must then be taken to lessen their numbers, but such instances in the East are rare, and the same methods for crop protection suggested in the case of the Red-wing will usually prove satisfactory.

511b Quiscalus quiscula æneus (Ridgway).

Bronzed Grackle.

Differs from the last in having the back, rump and abdomen plain metallic bronze without iridescent edges to the feathers.

Mr. Chapman states that it is a transient in the vicinity of New York, and I shot a single specimen west of Medford, February 8th, 1898.

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[1] Cassinia, 1904, p. 68.
[2] Birds of Princeton, p. 60.
[3] Bird Lore, Christmas Lists, 1902, 1903, 1904.

513 Megaquiscalus major (Vieillot).

Boat-tailed Grackle.

Adult male.—Length, 16. Wing, 7.50. Glossy blue-black, tinged with purple on the head, throat and breast; wings and tail duller.
Female.—Smaller and browner; under parts, dull buff.

A very rare straggler from the south.

Mr. Philip Laurent states that two of these birds made their appearance at Anglesea, Cape May county, along with the Purple Grackles, in the spring of 1891, and one of them was shot by Mr. Samuel Ludlam.[1]

This is the only record for the State.

Family FRINGILLIDÆ.

Finches, Sparrows and Grosbeaks.

This is one of our largest families of birds, comprising the Finches and their allies. They are medium sized, with conical bills adapted for seed eating, though many are largely insectivorous. A few species are brilliantly colored, but the majority are brown and gray above, with plain or streaked breasts. In most cases the young are similar to the adults in general appearance. They are usually ground birds, often taking to the trees when alarmed, though some species are distinctly arboreal. Many are fine songsters, and all are economically of much value to the farmer, and deserve our careful protection. One introduced species, the English Sparrow, does not, however, come within this category, being in every sense a nuisance.

a. Mandibles crossed.
b. White wing bars. — White-winged Crossbill, p. 224
bb. No white wing bars. — Red Crossbill, p. 223
aa. Mandibles not crossed.
b. Plumage more or less bright blue.
c. Wing over 3. — Blue Grosbeak, p. 245
cc. Wing under 3. — Indigobird, p. 245
bb. Bright red or pink in plumage.

[1] O. and O., 1892, p. 88.

c. Crested, wings and tail (and in male whole body) red.
CARDINAL, p. 243
cc. Breast and under wing-coverts pink, rest of plumage black and white. ROSE-BREASTED GROSBEAK, p. 244
ccc. Cap, back and breast suffused with pink or crimson, or cap alone bright crimson.
d. Wing over 4.50. PINE GROSBEAK, p. 220
dd. Wing, 3.15–3.40. PURPLE FINCH, p. 222
ddd. Wing under 3. REDPOLL, p. 224
bbb. With bright yellow in the plumage.
c. Entirely yellow, except wings, tail and cap.
GOLDFINCH, p. 225
cc. Breast yellow, throat black. DICKCISSEL, p. 246
ccc. Whole under parts olive-yellow, bright yellow posteriorly.
EVENING GROSBEAK, p. 220
cccc. Crown and back of head dull yellow, rest of plumage gray.
PINE GROSBEAK (female), p. 220
ccccc. General plumage gray, suffused with yellow on the breast and back. EVENING GROSBEAK (female), p. 220
bbbb. Plumage largely white (sometimes tipped with buff) wings and tail partly black. SNOW BUNTING, p. 227
bbbbb. Throat, chest and whole head black, brown or slate-gray, in sharp contrast with the white of the breast and abdomen.
c. Sides bright rufous. CHEWINK, p. 242
cc. Sides slate-gray, like the chest. JUNCO, p. 238
bbbbbb. Plumage "sparrow-like," streaked brown and black above, below streaked or plain.
c. Center of throat from bill to breast black, sometimes fringed with pale tips, belly not streaked.
d. No white on outer tail feathers.
ENGLISH SPARROW, p. 221
dd. Outer tail feathers tipped with white.
LAPLAND LONGSPUR, p. 227
cc. Under parts plain, a single black spot in the middle of the breast.
d. Outer tail feathers tipped with white.
LARK SPARROW, p. 235
dd. No white on tail. TREE SPARROW, p. 236
ccc. Breast sharply streaked with brown or black.
d. Several outer tail feathers with white tips.
e. Tail over 3.50. CHEWINK (young), p. 242
ee. Tail under 3. LARK SPARROW (young), p. 235
dd. Outermost pair of tail feathers white tipped.
e. Wing over 3.50.
LAPLAND LONGSPUR (female), p. 227
ee. Wing under 3.40. VESPER SPARROW, p. 228
ddd. No white on tail.
e. Wing over 3.30.
f. Upper surface and streaks on breast rusty.
FOX SPARROW, p. 241
ff. Upper surface brown, under wing-coverts yellow or pink.
ROSE-BREASTED GROSBEAK (fem. or young), p. 244

ee. Wing under 3.30.

f. Streaks mere shaft lines, middle of breast tinged with yellow.

DICKCISSEL (young), p. 246

ff. Wing bars and base of tail yellowish.

PINE SISKIN, p. 226

fff. A bright buff line from bill over eye and around the gray ear-coverts.

SHARP-TAILED SPARROWS, pp. 232–234

ffff. No bright buff on side of face nor yellow on tail.

g. Outer tail feathers longer than middle pair. PURPLE FINCH (female), p. 222

gg. Outer tail feathers not longer than middle pair.

h. General ground color above pale brownish-gray.

IPSWICH SPARROW, p. 228

hh. General ground color above chestnut-brown or dark brown.

i. A strong black stripe down each side of the throat from the bill.

j. Tail over 2.50.

SONG SPARROW, p. 239

jj. Tail under 2.50.

SAVANNAH SPARROW, p. 229

ii. No well marked stripe on sides of throat.

SHARP-TAILED AND SEASIDE SPARROWS[1] (young), pp. 232–234

hhh. Ground color of head olive-green, and back rufous brown.

HENSLOW'S SPARROW, p. 231

cccc. Breast gray, obscurely mottled but not distinctly streaked, throat white.

d. Upper parts slaty-gray and olive.

SEASIDE SPARROW, p. 234

dd. Upper parts brown, streaked with black and buff.

e. Wing, 2.30–2.50. SWAMP SPARROW, p. 240

ee. Wing, 2.80–3.15. WHITE-THROATED SPARROW, p. 236

ccccc. Under parts plain, neither streaked nor mottled.

d. Breast washed with buff.

e. Tail, 2.50 or over. FIELD SPARROW, p. 238

ee. Tail, 2 or less. GRASSHOPPER SPARROW, p. 230

dd. Breast gray or white.

e. Wing, 2.80 or over.

f. Tail over 2.75.

g. Center of crown white.

h. Yellow spot before the eye.

WHITE-THROATED SPARROW, p. 236

hh. No yellow spot before the eye.

WHITE-CROWNED SPARROW, p. 235

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[1] Look here also for young of Chipping, Field and Grasshopper Sparrows.

gg. Crown brown, lighter in center.
WHITE-CROWNED SPARROW (young), p. 235
ff. Tail under 2.50.
ENGLISH SPARROW (female), p. 221
ee. Wing under 2.80.
f. Light stripe over the eye and black spot at nostril. CHIPPING SPARROW, p. 237
ff. No light stripe or black at nostrils.
FIELD SPARROW, p. 238
bbbbbb. Upper and under parts plain, no streaking anywhere.
c. White on outer tail feathers. GOLDFINCH (winter), p. 225
cc. No white on tail.
d. Slaty-olive above. SEASIDE SPARROW, p. 234
dd. Brown above, sometimes tinged with blue on rump.
e. Wing over 3. BLUE GROSBEAK (female), p. 245
ee. Wing under 3. INDIGOBIRD (female), p. 245

514 Hesperiphona vespertina (Cooper).

Evening Grosbeak.

Adult male.—Length, 8. Wing, 4.50. Back, sides of head and throat, olive-brown; rump, scapulars and under parts, wax yellow; forehead and sides of crown, bright yellow; middle of crown, tail, upper tail-coverts and primaries, black; secondaries, white; bill very large and heavy, yellowish.

Female.—Grayish-brown, lighter below and slightly tinged with yellow; wings and tail, black, much spotted and tipped with white.

A rare straggler from the northwest.

A flock of eight birds was seen by Mr. W. O. Raymond at Summit, March 6th, 1890, under circumstances that rendered the indentification certain.[1] This is the only New Jersey record.

515 Pinicola enucleator leucura (Müller).

Pine Grosbeak.

Adult male.—Length, 8.25–9. Wing, 4.50–5. General color dull pinkish-red; center of abdomen, flanks and under tail-coverts, gray; wings and tail, slate-gray, edged with lighter; two conspicuous white wing bars. The pink feathers are gray basally, and this color is apparent when the plumage is disturbed.

Adult female and young in first winter.—General plumage, gray; rump and head tinged with dull yellow. Young males sometimes show a trace of pink.

[1] O. and O., 1890, p. 46. *Cf.* also, Chapman, Birds vicinity of N. Y., p. 58.

Rare and irregular winter visitant.

The Pine Grosbeak is the largest of our rare visitors from far north, and, in south Jersey at least, the rarest. When it does visit us it is usually in considerable flocks. The birds are rather stupid, and are easily approached.

The last general flight of Pine Grosbeaks was in the winter of 1903-4, but while common in the northern counties, where it arrived October 15th (Englewood, Chapman), it was not noted in the southern half of the State.[1]

It was abundant at Weehawken,[2] October, 1836, to March, 1837. Mr. H. Trippitt[3] records some at Montclair in autumn, 1884, and Professor A. H. Phillips[4] saw a flock at Princeton in 1886. On March 8th, 1896, two were seen near Ridgewood by Mr. DeL. Berier,[5] while in the winter of 1899-1900 Mr. W. A. Babson saw them at Princeton and Summit.[4] On Christmas day, 1903, they were seen at Montclair, and in 1904 at Leonia.[6]

Passer domesticus (Linnæus).

House Sparrow, English Sparrow.

Adult male.—Length, 5.50–6.25. Wing, 2.85–3. Crown, gray, with a chestnut patch on each side behind the eye; rump, gray; back streaked with black and chestnut; wing-coverts largely chestnut, tipped with white; lower parts, white or grayish-white; middle of throat and upper breast, black.

Female.—Above, grayish-brown, streaked with black and buff; below, grayish-white.

Nest in any hole or shelter about buildings, etc.; eggs, five, white, finely mottled with olive-brown, 1.82 x .62.

Abundant resident, except in most remote spots.

The first Sparrows were imported to this country by the directors of the Brooklyn Institute in the autumn of 1850, and eight pairs were liberated in Brooklyn the following spring, but they did not thrive. In 1852 a larger number were brought over, fifty of which were liberated in the "Narrows" and the rest in Brooklyn in the spring of 1853.

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[1] *Cf.* Abst. Linn. Soc., N. Y., XV., p. 8; Bird Lore, 1903, p. 199; Bird Lore, 1904, p. 98.

[2] Ward, Trans., N. Y., Acad. Sci., IV., p. 5.

[3] Oologist, 1886, p. 39.

[4] Babson, Birds of Princeton, p. 60.

[5] Auk, 1896, p. 175.

[6] Bird Lore, Christmas Lists, 1904 and 1907.

In 1860 and 1864 they were introduced in New York City, and 1869 the largest importation of all, one thousand birds were liberated in Philadelphia. Other smaller importations were made at more remote points, but the New Jersey birds undoubtedly spread from the above colonies.

The subsequent history of the bird and its disastrous effect upon our native species is too well known.[1]

517 Carpodacus purpureus (Gmelin).

Purple Finch.

Adult male.—Length, 5.50–6.25. Wing, 3.25. General color pinkish-red, more crimson on the head and rump; streaked above with dusky and feathers edged with gray; wings and tail, dusky, narrowly edged with pink, two dull pink wing bars; center of abdomen and crissum, white, a few dusky streaks on the flanks.

Adult female and young in first winter.—Above, olive-brown, streaked with dusky, with some white edgings; below, white, tinged with buffy, boldly streaked with dark brown.

Nest of grass and twigs lined with hair, placed on the horizontal limb of an evergreen; eggs, four to six, blue, spotted with brown around the larger end, .85 x .65.

Regular winter visitant, but most plentiful in migrations. Rare summer resident in the northern counties; has been seen, in summer, at High Knob, Sussex county (Chapman), Plainfield (Miller) and Ridgewood (Hales).[2] Arrives September 25th, departs May 1st.

Throughout the greater part of the State the Purple Finch is associated with leafless trees and snow-covered ground, or with early spring and bursting buds, and only in the most northern portion is it a bird of summer. Throughout the winter the Purple Finches associate in flocks, generally only a few of the old males in each, the bulk being females and young in the brown plumage—distinguished from Sparrows by the great amount of white edgings in the plumage and the lack of buff and rusty tints.

They feed on seeds among the branches of the trees as well as on the ground and in spring are fond of buds.

The song is a rather prolonged melodious warble.

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[1] W. B. Barrows, The English Sparrow in N. A.; Bull. 1, Div. Econ. Ornith. and Mam., U. S. Dept. Agr., 1889.

[2] O. and O., 1888, p. 56.

521 Loxia curvirostra minor (Brehm).

Red Crossbill.

PLATE 54.

Adult male.—Length, 5.50–6.25. Wing, 3.50. General color, dull brick red, brightest on the rump; head and breast, wings and tail, blackish.

Adult female.—Grayish-olive instead of red, becoming bright yellow-olive on the rump.

Young male in first autumn and first breeding season.—Variously mottled olive, yellow and red.

Young in first summer.—Olive-gray above, whitish below, streaked everywhere with dusky olive.

Irregular visitant, usually in winter.

The Crossbills visit us always in flocks, and are particularly partial to evergreens, prying apart the scales of the cones and scooping out the seed and such insects as may lurk there. Their peculiar crossed mandibles and their habit of climbing about reminds one not a little of diminutive Parrots.

In midwinter, flocks often visit the evergreens about our houses, being plentiful one year and absent the next. In the pine barrens, too, they are found frequently.

The Crossbill has never been found breeding in New Jersey, although Mr. E. P. Bicknell[1] discovered a nest, with eggs, at Riverdale, New York, April 30th, 1875, but a short distance beyond the State boundary. The birds have, however, occurred a number of times in summer. John Krider[2] states that he has taken them at Red Bank, on the Delaware, in June. W. B. Evans[3] saw them May 6th, 1900, at Hanover; Dr. W. E. Hughes,[3] at Forked River, June 6th, 1900; George E. Hix,[4] in northern Somerset county, July 19th, 1903, and S. N. Rhoads, at Wawayanda Lake, June 5th, 1909.

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[1] Amer. Nat., 1876, p. 237; B. N. O. C., 1880, p. 7.
[2] Field Notes, p. 44.
[3] Abst. Proc. D. V. O. C., IV., p. 6.
[4] Bird Lore, 1903, p. 166.

522 Loxia leucoptera Gmelin.

White-winged Crossbill.

Adult male.—Length, 6–6.50. Wing, 3.50. General plumage bright pinkish-red; center of abdomen and crissum, gray, the latter bordered with whitish; wings, scapulars and tail, black; two broad white wing bars and white tips to the inner tertials; a black spot behind the eye and another on the side of the neck.

Adult female.—General plumage grayish, broadly streaked with blackish; rump, bright yellow; wings as in the male.

Young male in first winter.—Body mainly chrome-yellow with little red.

Rare and irregular winter visitant.

This Crossbill is much rarer than the last and visits us only occasionally. Audubon, writing at Camden, in the first week of November, 1827, says: "They are so abundant that I am able to shoot, every day, great numbers out of the flocks that are continually alighting in a copse of Jersey scrub pine, opposite my window.

Cassin states that they were present in the winter of 1836-7, and were not seen again until 1854-5, when they were unusually plentiful among the pines about Camden, and so tame that they could be killed with stones.[1]

Mr. S. N. Rhoads saw a small flock at Haddonfield in the winter of 1896-7, and from December 10th, 1899, to March 20th, 1900, they were present at Princeton,[2] and were seen the same year in the Orange Mountains (Babson), and at Englewood February 21st—March.[3] Mr. C. H. Rogers records four at Leonia, December 25th, 1906.[4]

A single bird that had been caught by a cat at Cape May, February 5th, 1909, was presented to me by Mr. H. Walker Hand.

528 Acanthis linaria (Linnæus).

Redpoll.

Adult male.—Length, 4.50–5. Wing, 2.80–3. Above, grayish-brown, streaked with dusky, and somewhat mottled with white; lighter on the rump, which is tinged with pink; crown, bright crimson; wings and tail, dusky, with two

[1] Proc. Acad. Nat. Sci., Phila., VII., p. 203.
[2] Babson, Birds of Princeton, p. 61.
[3] Chapman, Bird Lore, 1900, p. 59.
[4] Bird Lore, 1907, Christmas Lists.

lighter wing bars; under surface, rosy-pink on breast and throat; abdomen, white; chin, dull black, sides streaked with dusky.

Adult female and young in first winter.—Similar, but without the pink rump and breast, and with the crown patch less developed.

A rare and irregular visitant. It was recorded as present in the winters of 1836-37 and 1878-79; after the great blizzard of March, 1888; also in 1899-1900, 1906-07, 1908-9. My most southerly records in the State are Haddonfield (Rhoads, 1888), and Swedesboro (C. D. Lippincott, 1909).

The Redpoll is a bird of severe winters. When driven south by the scarcity of food it appears in considerable flocks, feeding on the weed seed in field and gardens.

It has the Goldfinch habits, and in appearance is essentially a Pine Finch, with crimson cap and black chin.

528b Acanthis linaria rostrata (Coues).

Greater Redpoll.

Larger than the Common Redpoll. Length, 5.25–5.75. Wing, 3.05–3.30 in male; 2.95–3.25 in female. Bill shorter, thicker and less acute.

Rare straggler from the north, associating with the other form.

Two specimens in the Princeton University collection were shot by Mr. W. E. D. Scott, at Princeton, February 6th, 1872, and are recorded by Mr. Babson.[1] Professor Phillips assures me that they are correctly identified.

529 Astragalinus tristis (Linnæus).

Goldfinch, Yellowbird.

PLATE 55.

Adult male.—Length, 4.50–5.25. Wing, 2.75. General color, bright canary-yellow; under tail-coverts, white; cap, wings and tail, black; two white wing bars and inner webs of tail feathers, white terminally.

In winter.—Light olive-brown above, paler beneath, tinged with yellow on the throat; wing feathers strongly edged or tipped with white (usually worn off by summer).

[1] Birds of Princeton, p. 62.

Adult female.—Similar to winter male but duller; sometimes more yellow below.

Young in first summer.—Cinnamon-brown above and on sides and flanks; rest of under surface, yellow; wing bars and tips, pale cinnamon.

Nest of grass and other vegetable fibers thickly lined with thistle-down, placed usually in an upright fork of a tree, ten to twenty feet up; eggs, three to six, plain bluish-white, .65 x .50.

Common resident.

In summer the Goldfinch is a familiar denizen of the gardens and orchards. The bright yellow and black plumage, the canary-like call, and the undulating flight, calling as he flies "per-chic-o-ree, per-chic-o-ree," as Chapman writes it, all aid to fix the Goldfinch or Salad Bird in the mind of even the most casual observer.

In autumn and winter Goldfinches gather in flocks, and course through the fields and along the fence rows, descending on the patches of thistles and other weeds that offer a repast of seeds, and then dash away all together as one approaches. At this season they are in their sombre winter garb, but the undulating flight and canary call note still remain unmistakable.

In September and April they may be seen in the mottled molting plumage, presenting all sorts of curious combinations of brown and yellow.

533 Spinus pinus (Wilson).

Pine Siskin, Pine Finch.

Adults.—Length, 4.50–5.25. Wing, 2.75. Above, grayish-brown, heavily streaked with blackish; wings with two narrow lighter bars, and a pale yellow band across the base of the primaries very conspicuous in flight; under surface, white, heavily streaked with dusky and tinged with buff on the breast and flanks.

Young in first summer.—Similar, pale yellow below.

Winter visitant; irregular in its abundance. Arrives October 15th, departs April 25th. Sometimes seen as late as May 17th.

The Pine Siskin resembles the Goldfinch in habits, but is always to be distinguished by its striped plumage and the yellow patch on the expanded wing. It is most frequent about alder thickets or feeding about the cones of evergreens.

534 Plectrophenax nivalis (Linnæus).

Snow Bunting.

Adult male in winter.—Length, 6–7. Wing, 4–4.25. General color, white, with black tail and wings largely black; all the white of the upper parts suffused with rusty, the black feathers of the back broadly edged with white and rusty, most of the wing-coverts and the secondaries pure white; below, white, with a rusty spot on each side of the breast.

Adult female in winter.—Similar, but white areas reduced and top of head blackish, edged with white.

Rare and irregular winter visitant.

The Snow Bunting comes down from the north in flocks regularly as far as Long Island, but in New Jersey its occurrence seems to be irregular; more frequent along the coast and up the Delaware shore as far as Philadelphia. Several large flocks were observed about Princeton in the winter of 1895-96 (Babson), and it has been seen in winter at Summit (Hann), Plainfield (Miller), Morristown (Thurber), the Hudson Valley (Chapman), and Orange Mountains (Van Rensellaer).[1]

The great amount of white on the wings distinguishes it from any other species.

536 Calcarius lapponicus (Linnæus).

Lapland Longspur.

Adult male in winter.—Length, 6–7. Wing, 3.50–3.75. Above, grayish-brown, broadly streaked with black; broad collar around the hind neck, chestnut, more or less obscured by buffy tips to the feathers; sides of face, buff, bordered by a black line; below, white, tinged with buff; whole throat, black, the feathers heavily tipped with buff, sides streaked with blackish; two outer tail feathers, largely white.

Adult female in winter.—Similar, but black areas less extensive and hind neck streaked with black.

The Longspur occurs in New Jersey as a wanderer from the far north, generally single individuals which have accompanied flocks of Snow Buntings or Horned Larks. There are the following records of its occurrence:

Princeton; February 13th, 1895. A. H. Phillips (Coll. A. H. P.).

[1] Oologist, 1895, p. 79.

Washington Park, on the Delaware; February 14th, 1895. Isaac S. Reiff (Coll. W. Stone).

Salem; December 28th, 1898. Henry Warrington (Coll. W. Stone).

Thurber reports it as very rare at Morristown, and Chapman as rare near New York City.

540 Pocecetes gramineus (Gmelin).

Vesper Sparrow.

Adults.—Length, 5.50–6.50. Wing, 3.20. Above, grayish-brown, strongly streaked with black; wings and tail, dusky, edged with grayish-brown; outermost tail feather, mainly white, next one white, white on both webs toward the end, the shaft remaining dusky; under parts, white, slightly tinged with buff; streaked with dusky across the breast and down the sides and flanks. Buff and brown tints and wing edgings more conspicuous in autumn.

Young in first summer.—Similar, but paler.

Nest of grass lined with rootlets, hair, etc., placed on the ground; eggs, four to five, bluish-white, spotted and scrawled with brown, .80 x .60.

Common summer resident. Arrives March 16th (March 30th), departs November 1st. Winters sparingly in the southern counties; Haddonfield, December 29th, 1880 (S. N. Rhoads); Princeton, January 21st, 1879 (W. E. D. Scott); Crosswicks, winter of 1904-5 (C. C. Abbott), and more regularly in Cape May and Cumberland.

The Vesper is the characteristic Sparrow of the dry old fields with Indian grass and low briers scattered here and there, and of the open country roadside. He is dusty colored, like the ground upon which he runs, but may be told at once from all our other Sparrows by the white lateral tail feathers which he displays as he flits along ahead of us.

The song of the Vesper is a loud chant, uttered as he perches on the top of some small tree or on the telegraph wire along the roadside. It resembles the song of the Song Sparrow, but the melody is different.

541 Passerculus princeps Maynard.

Ipswich Sparrow.

Adults.—Length, 6.50. Wing, 3. Above, pale grayish; top of head and back streaked with pale brown and blackish; a whitish stripe over the eye and a short one down the crown; wings edged with pale cinnamon, tertials with whitish; under parts, white, streaked with brown across the breast and down the sides.

Spring males have a spot of yellow in front of the eye.

Tolerably common winter resident on the sand hills of the coast. November 3d to April 16th.

This bird, which is essentially a large, pale Savanah Sparrow, is restricted to the immediate vicinity of the seabeach, where it easily escapes notice, so closely does its coloration match that of the sand.

It was first detected on the New Jersey coast by Alexander Wilson,[1] who described and figured it as the male Savanah Sparrow. It was not noticed here again until December 30th, 1879, when Dr. W. L. Abbott[2] obtained a specimen in Cape May county. Since then a number of specimens have been secured all the way from Squan Beach to Cape May, and it has been found on nearly every occasion when it was sought for in winter.[3]

Dr. William E. Hughes found it most abundant during March and November, evidently the times of migration.[4]

542a Passerculus sandwichensis savanna (Wilson).

Savannah Sparrow.

Adults.—Length, 5–5.50. Wing, 2.75. Above, grayish-brown, heavily streaked with black, and feathers more or or less edged with grayish; wing feathers strongly edged with brown; a yellow line over the eye; under parts, white (tinged with buff in the autumn); streaked with black on the breast and sides.

Young in first summer.—Similar, but more buffy above and strongly tinged with buff below; the breast streaks less conspicuous.

Nest of grass on the ground; eggs, four to five, bluish-white, thickly spotted with brown, .75 x .55.

Common transient visitant. Spring, March 16th to May 15th; autumn, September 1st to October 20th. Regular winter resident in Cape May county, and rare breeder in the northern counties and on the coast. Mr. Thurber (1887) says it nests at Morristown, and Mr. J. H. Clark makes the same statement for Paterson. Mr. W. B. Crispin states that he found one nest near Salem, and Mr. W. D. Miller

[1] *Cf.* Stone, Osprey, II., p. 117.

[2] Forest and Stream, XIV., p. 44.

[3] *Cf.* Abst. Proc. D. V. O. C., I., p. 7; II., p. 3; Auk, 1892, p. 204; Bull. Nutt. Orn. Club, 1881, p. 116.

[4] Abst. Proc. D. V. O. C., III., pp. 5, 8.

found one July 8th, 1903, on Seven Mile Beach.[1] A single bird was shot at Cape May, July 6th, 1891, by Mr. F. D. Stone, Jr.[2]

This is a rather inconspicuous migrant, occurring in old fields where it runs in the manner of the Grasshopper Sparrow, but in coloration resembles more nearly the Song Sparrow. The shorter, more pointed tail and yellow spot before the eye, however, serve to distinguish it.

Its song is somewhat like that of the Grasshopper Sparrow, and has been well given by Dr. Dwight, "tsip, tsip, tsip, sé-e-e-sr-r-r."

In winter I have found the Savannah Sparrow literally swarming on the low swamp land about Cape May, and doubtless it winters at other points along the coast.

546 Ammodramus savannarum australis Maynard.

Grasshopper Sparrow.

Adults.—Length, 5. Wing, 2.50. Upper parts, mingled blackish and rusty brown, with gray and buff edgings to the feathers; head, dusky, with a median buff stripe; a spot of yellow in front of the eye; under parts, white, with the breast and sides buff; a few of the feathers with brown shaft lines.

Young in first summer.—Similar, but buff tints more prominent above; under surface with whole breast and sides streaked with dusky.

Nest of grass placed on the ground; eggs, four to five, pearly-white, spotted rather sparingly with brown, .72 x .55.

Common summer resident. Arrives April 21st (April 28th), departs October 20th.

The Grasshopper Sparrow is a bird of the dry upland field, easily overlooked as it is conspicuous neither in dress nor in song. Near the nest the male will perch on a weed stalk, like the Henslow's Sparrow, and utter his insignificant song, "tick, tick z-z-z-z-z-z-zz," resembling, more than anything else, the noise made by one of our large green grasshoppers. At other times they remain on the ground searching for food among the grass, occasionally mounting a fence post to sing. Once heard this song is readily recognized as it has penetrating qualities that carry it for long distances.

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[1] Auk, 1906, p. 340.

[2] Birds of E. Pa. and N. J., p. 113.

547 Passerherbulus henslowi (Audubon).

Henslow's Sparrow.

Adults.—Length, 5. Wing, 2.15. Above, head and neck, light olive; back and rump, chestnut, many feathers with black centers and gray edgings; wings largely edged with chestnut; below, buffy-white, deepest on chest; breast and sides finely streaked with black.

Young in first summer.—Dull brownish-buff above, spotted with black; yellowish-white below, with a few dusky streaks on the sides.

Nest of grass well concealed in a tussock; eggs, four to five, dull white, speckled with reddish-brown, .75 x .55.

Local summer resident, especially in the southern half of the State.

This obscure little Sparrow is found in the cranberry bogs of the pine barrens, in open swamps along the coast and similar localities in some of the northern counties. Recent investigations on the part of the Delaware Valley Ornithological Club seem to show that this bird is not so scarce as was formerly supposed, or else has increased in numbers of late years.

The former seems to me the more likely, as the bird is very easily overlooked, although once our attention has been called to its note we are not likely again to pass it by.

Audubon had exactly the same experience as our modern observers since he says: "This species is abundant in the State of New Jersey and breeds there, but of this I was not aware until * * * the spring of 1838, when my friend, Dr. James Trudeau, sent me a specimen procured by himself while in company with our mutual friend, Edward Harris, Esq." And in another place, apparently adopting the view of a change in its abundance, he says: "It has become a common bird in the State of New Jersey."

Wilson was entirely unacquainted with it as was Nuttall, so far as personal experience goes. Turnbull regarded it as rather rare in the State.

Mr. John McIlvain obtained a number of specimens on Seven Mile Beach in June, 1875,[1] and Mr. H. G. Parker found a nest there on May 27th, 1885.[2] The next year Dr. A. P. Brown found that it was present in boggy tracts near Point Pleasant,[3] and on August 8th, 1889,

[1] A. R. Justice, Atlantic Slope Nat., I., p. 79.
[2] O. and O., XI., p. 140.
[3] Stone, Birds of E. Pa. and N. J., p. 114.

Dr. S. D. Judd secured a young bird at Boonton, Morris county,[1] and at Morristown Thurber (1887) states that it is a locally common summer resident. Mr. Babson[2] states that Mr. Scott took several during the summer in the neighborhood of Princeton.

On May 22d, 1894, Mr. F. L. Burns found a nest on Peck's Beach.[3]

On May 30th, 1895, Mr. Stewardson Brown found Henslow's Sparrows at Forked River, New Jersey,[4] and at about the same time Mr. W. D. W. Miller found them on the mountains north of Plainfield. In 1900-1902 Mr. Miller found them at various points in the Passaic Valley, Great Swamp, etc., in the vicinity of Plainfield;[7] while in April and May, 1902, Mr. S. N. Rhoads discovered them near Greenwich, Cumberland county.[4] Since then, with our attention especially directed toward this species, the Philadelphia ornithologists have located the bird in fresh-water bogs all along the coast and at various points in the pine barrens, even in a bog near Lindenwold, within five miles of Haddonfield.[5]

In swamps occupied by Henslow's Sparrows the male may be seen perched upon an old weed stalk, every now and then throwing back his head and uttering an explosive "chee-slick." When disturbed he will drop to the ground, and it is with difficulty that he is flushed, as he prefers to run like a mouse here and there under the tufted grass.

Mr. John D. Carter[6] found a nest and eggs of Henslow's Sparrow near Marlton, in May, 1905, and another was found by C. J. Hunt, below Millville, July, 1908,[7] but they are exceedingly hard to locate.

549 Passerherbulus caudacutus (Gmelin).

Sharp-tailed Sparrow.

Adults.—Length, 5–5.75. Wing, 2.25. Above, olivaceous brown, mingled with gray, and with light grayish-white streaks on the scapulars; a broad, deep buff stripe over the eye and another from the base of the bill, which curves up around the auriculars and joins the first one; wings edged with light brown; under parts, white, strongly suffused with buff on the breast, sides and under

[1] Auk, 1897, p. 326.
[2] Birds of Princeton, p. 63.
[3] Auk, 1895, p. 189.
[4] Rhoads, Cassinia, 1902, pp. 6–14, a full history of the bird in N. J.
[5] Stone, Cassinia, 1903, p. 76.
[6] Cassinia, 1906, p. 62.
[7] Cassinia, 1908, p. 16.

tail-coverts, and conspicuously streaked with black, except on the throat and middle of the abdomen.

Young in first summer.—Above and below, buff; top of head and broad stripes on the back, black; lower parts streaked on breast and sides with dusky.

Nest of grass on the ground; eggs, greenish-white, speckled with reddish-brown, .75 x .55.

Abundant summer resident on the salt meadows of the coast and Delaware Bay, and in the vicinity of New York City; occasional in winter, at least from Atlantic City southward. Has also been taken on the Passaic below Chatham (Thurber).

This is the most abundant bird on the broad salt meadows which line our coast. It may be seen running about over the muddy flats where a scant growth of grass serves as shelter, and now and then fluttering up a few feet in the air, uttering a curious spluttering song as it sinks back on outstretched wings to the cover of the "thatch." The plumage of these birds is subjected to great wear by the coarse grass in which they live, and, unlike most Sparrows, they have two complete moults a year, so that May and October specimens are in beautiful fresh plumage, while in March and August they are worn to a dull grayish tint, with the markings very indistinct.

549.1 Passerherbulus nelsoni (Allen).

Nelson's Sharp-tailed Sparrow.

Similar to the Sharp-tailed Sparrow, but smaller, especially the bill; colors above, brighter and very sharply contrasted, the white streaks very prominent; buff on breast much deeper and brighter, and streaks almost absent or very pale.

Rather scarce transient visitant, associating with the preceding on the salt meadows of the coast; also in the Hudson Valley.[1] Specimens have been taken May 9th and October 10th, 1892, by Mr. I. N. DeHaven.[2]

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[1] Chapman, Birds Vicinity of N. Y., p. 171.

[2] Stone, Birds of E. Pa. and N. J., p. 115.

549.1a Passerherbulus nelsoni subvirgatus (Dwight).

Acadian Sharp-tailed Sparrow.

Similar to the preceding in size but paler than true *caudacutus;* upper parts more uniform olive-gray, white streaks dull; below, pale buff on breast, with streaks of pale gray.

Rather common transient visitant, associating with the preceding on the salt meadows of the coast;[1] rather rare in the Hudson Valley.[2]

550 Passerherbulus maritimus (Wilson).

Seaside Sparrow.

Adults.—Length, 5.25–6. Wing, 2.50. Above, olive-gray, more strongly olive on the back and on the sides of the crown; wings edged with brown and olive; a yellow streak in front of the eye; under parts, dull white, streaked with gray.

Young in first summer.—Above, brownish, streaked with black on head and back; below, white, breast and sides tinged with buff and narrowly streaked with black.

Nest of grass situated on the ground; eggs, four to five, white, thickly spotted with brown, .80 x .60.

Common summer resident of the salt marshes of the coast and Delaware Bay. Mr. W. L. Baily found a few at Seaville, Cape May county, February 22d, 1892.[3]

Similar to the Sharp-tailed Sparrow in habits, song, etc.; easily distinguished by its uniform gray plumage and lack of stripes below.

It has always seemed to me to prefer the wetter parts of the meadows, while the Sharp-tail is a bird of drier, sandy spots, at least during the nesting season.

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[1] *Cf.* Stone, Auk, 1893, p. 85.
[2] Chapman, Birds Vicinity of N. Y., p. 171.
[3] Stone, Birds of E. Pa. and N. J., p. 115.

552 Chondestes grammacus (Say).

Lark Sparrow.

Adults.—Length, 6.25. Wing, 3.50. Above, grayish-brown, streaked on the back with black; head with a chestnut stripe down each side of the crown, becoming black at the base of the bill; ear-coverts, chestnut, connected with the bill by a black line and another black line down the side of the throat; wing-coverts tipped with buff and a buff spot on the base of the outer primaries; tail, black, all but the middle pair of feathers tipped with white, the outer ones nearly half white.

Very rare straggler from the west.

One was taken at Schraalenburg, November 26th, 1885, by F. M. Chapman,[1] which is the only New Jersey record.

554 Zonotrichia leucophrys (Forster).

White-crowned Sparrow.

Adults.—Length, 6.50–7.50. Wing, 3.25. Above, grayish-brown, broadly striped on the back with rich brown, the feathers edged with gray; head, black, with a broad snowy white band down the middle, extending onto the hind neck, and a narrow white line over the eye; two narrow white wing bars; under parts, pale gray, rather lighter on the throat and abdomen; under tail-coverts, buff.

Young in first autumn.—Buffy-brown above, streaked on the back with dark brown; head, chestnut-brown, instead of black; light stripes dull buff instead of white; under surface tinged with buff.

Rather rare transient visitant. Spring, May 2d to 13th; autumn, October.

This bird is often confused with the White-throated Sparrow, from the fact that the young and old of the latter differ so much in the coloration of the head. The old White-throats have such a brilliant white and black crown, contrasted with the dull-colored head of the young bird, that they are at once set down as White-crowns. As a matter of fact, the White-crown in my experience does not mingle with the other species, being more solitary in habits. Its crown stripe is broader than the most highly-colored White-throat, and the area in front of the eye is black instead of yellow. There is, moreover, no

[1] Auk, 1886, p. 136.

trace of a white throat patch, and the crown feathers are usually partly elevated.

Mr. Babson states that they were unusually plentiful in the fall of 1876, when Mr. W. E. D. Scott secured upwards of fifty near Princeton.

558 Zonotrichia albicollis (Gmelin).

White-throated Sparrow.

PLATE 56.

Adults.—Length, 6.50–7.50. Wing, 3. Above, bright rusty brown; duller on the rump, broadly striped with black and some of the feathers edged with buff; crown, black, with a narrow white median stripe becoming buff posteriorly; a buffy-white line over the eye, becoming yellow in front, two narrow white wing bars; throat and abdomen, white; breast, sides of face and sides of body, slaty-gray; flanks, brownish. Female often rather duller.

Young in first autumn.—Similar to adults above, except that the crown is mainly brown and the yellow spot before the eye is much less distinct; below the white throat is but poorly defined and the gray is mottled with dusky spots.

Common transient visitant, wintering locally in the southern part of the State and less frequently in the northern half. Arrives September 20th, departs May 15th.

The White-throats arrive from the north in small flocks and take up their residence in some thicket of briers in the woods, or even in the evergreens in the garden. They sing throughout the winter, their clear whistle never failing to attract attention. The first note is low, the others all much higher, and it is frequently interpreted as "Old Sam Péabody, Péabody, Péabody," which has given the bird in its summer home to the northward the name of Peabody bird.

559 Spizella monticola (Gmelin).

Tree Sparrow.

Adults.—Length, 6–6.50. Wing, 3. Above, grayish-buff, feathers on back streaked with black and chestnut; hind neck, pure gray; top of head, chestnut; wings edged with cinnamon rufous; two conspicuous white wing bars; tail edged with pale buff; under parts, pale gray, whiter on the abdomen; a chestnut patch on each side of the breast and a dusky spot in the middle of the chest; sides shaded with brownish; upper mandible dusky; lower yellow.

Common winter visitant. Arrives October 25th, departs April 15th.

This species, in many ways a large edition of the Field Sparrow, frequents the alder thickets and brier patches, and even when the ground is white with snow they remain in their chosen shelter, indulging in a chorus of half-formed songs as the sun begins to warm them up—a suggestion of what they can do in their summer home to the northward. The plain breast with a single black spot will distinguish the Tree Sparrow from all other species.

560 Spizella passerina (Bechstein).

Chipping Sparrow.

PLATE 57.

Adults.—Length, 5–5.75. Wing, 2.75. Back, light brown, broadly streaked with black; hind neck and rump, gray; crown, chestnut; forehead, black, with a median gray streak; a white line over the eye and a black one through it; wings edged with pale brown; two narrow buffy bars; under parts, white, shaded with gray on the sides. In winter the chestnut-brown is veiled with buff and streaked with black, and the white areas are tinged with buff.

Young in first summer.—Above, buffy-brown, heavily streaked with black, with sometimes a faint tinge of chestnut on the crown; below, white, streaked with dusky, except on the middle of the abdomen.

Nest of fine rootlets and twigs, lined abundantly with horsehair; eggs, four to five, greenish-blue, marked with black about the larger end, .70 x .52.

Abundant summer resident. Arrives March 22d (March 29th), departs October 25th. Rarely occurs in the winter in the southern counties.

The Chippy is the most familiar of our Sparrows, preferring the gardens and orchards to the swamps and woodlands. He picks up his food from the lawn or gravel walk, and if unmolested rears his brood in the vines about the porch, and trills his song from the top of the evergreen bush in the yard. This effort is not of a high order as a musical production, consisting of a monotonous insect-like trill, "chippy, chippy, chippy, chippy."

In autumn, old and young flock out into the fields along with the other Sparrows, and occasionally one or two may remain in the winter Sparrow flocks. Mr. W. L. Baily noted one at Seaville, Cape May county, late in November.[1]

[1] Birds of E. Pa. and N. J., p. 117.

563 Spizella pusilla (Wilson).

Field Sparrow.

PLATE 57.

Adults.—Length, 5.25–6. Wing, 2.50. Above, grayish-brown, tinged with rusty; back streaked with chestnut and black, head rusty with a median gray stripe; wings edged with rusty brown, tail with gray; two buffy wing bars; lower parts, pale grayish, tinged with buff on breast and sides; more rusty above in winter and lower surface much more buff; bill, cinnamon rufous.

Young in first summer.—Duller than the adults, with breast and sides streaked with dusky.

Nest of grass in a low bush or on the ground; eggs, four to five, bluish-white, thickly speckled with rusty markings, .65 x .50.

Common summer resident. Arrives March 4th (March 19th), departs November 1st. In southern counties it is a tolerably common winter resident, often mingling with the Tree Sparrows, and a rare winter resident in the north—Englewood[1] and Plainfield.[2]

The Field Sparrow is the representative of the Chippy in the old fields and borders of woods and thickets. Of the same size and slender build, it is distinguished by its more rusty coloration, the absence of a distinct crown patch and the reddish instead of black bill.

The song of the Field Sparrow is a plaintive strain, beginning slowly and becoming more rapid until it dies away in a trill—fee-o, fee-o, fee-o, few-few-few tr-r-r-r-r; while subject to some variation the same general character is maintained.

In the swamps of the southern half of the State a certain number of Field Sparrows winter regularly, sometimes in little bands by themselves, sometimes mingled with Tree Sparrows, Juncos, etc.

567 Junco hyemalis (Linnæus).

Slate-colored Junco. Snowbird.

PLATE 58.

Adult male.—Length, 5.50–6.25. Wing, 3. Upper parts, slate color, darkest on the head, wings and tail, which are blackish-slate; outer tail feathers, white; next one, white, with terminal streaks of slate, the third, slate, with a

[1] Chapman, Abst. Proc. Linn. Soc., N. Y., V., p. 3, and Bird Lore, Christmas List, February, 1901.

[2] Chapman, Birds Vicinity N. Y., p. 65.

white streak; tertials edged with brownish; under surface as far down as middle of breast, slate, continuous with that of the upper parts, remainder white; bill, pinkish.

Adult female.—Similar, but paler, and tinged with brown above.

Young in first winter.—Similar, the females still browner.

Young in first summer.—Grayish-brown, streaked with black above; below, white, heavily streaked with dusky, except on the middle of the abdomen.

Abundant winter visitant. Arrives October 1st, departs April 25th.

The Junco is probably our best known winter bird. Its slate-colored plumage and conspicuous white tail feathers easily distinguish it from other small birds.

The Juncos remain in considerable flocks throughout the winter, frequenting the fence rows and edges of the woods, except when severe weather drives them into the garden and up to the doorstep in search of food. In early spring we hear them trilling their low, Chippy-like song, though for the most part they have only a Sparrow-like chirp while they are with us.

The Junco may possibly nest in the extreme northwestern corner of the State, as it is a summer bird in Pike county, Pennsylvania, just across the river, but as yet we have no record of the fact.

581 Melospiza melodia (Wilson).

Song Sparrow.

PLATE 59.

Adults.—Length, 6.50. Wing, 2.50. Above, wood brown, grayer on the rump and hind neck; back broadly streaked with black; head narrowly streaked with black and with a gray median stripe; wing-coverts and tertials with black centers; under parts, white, tinged with buff across the breast; streaked on breast and sides with black and rusty brown, streaks merged on the center of the breast forming a spot; a pale gray line over the eye; a buff stripe from the base of the bill, bordered above and below with black.

Young in first summer.—Similar, but more buffy above and below, streaks on the breast narrower.

Nest of grass, leaves and rootlets, either on the ground or in a low bush; eggs, four to five, bluish-white, thickly blotched with brown, .80 x .60.

Abundant resident; more generally distributed in summer.

The Song Sparrow is found throughout the State in swamps, and thickets along the borders of streams, and about our gardens, though less common in the last locality than it was prior to the arrival of the English Sparrow.

In the early spring we hear him tuning up, and many people think he has just arrived from the south. His song is among the best of our spring bird music, and sometimes I think familiarity produces in us a lack of appreciation of what a fine song it really is.

In winter the Song Sparrow is found abundantly all over the broad river meadows, and along the borders of streams and ditches, flitting along below the banks or among the tufts of grass.

583 Melospiza lincolni (Audubon).

Lincoln's Finch.

Adults.—Length, 5.50. Wing, 2.50. Upper parts, brownish-olive, sharply streaked with black from head to rump; crown with a gray median stripe and a gray stripe over the eye; under parts, white, with a broad buff band across the breast and down the sides; chest, sides, flanks and under tail-coverts streaked with black.

Rare transient visitant. Spring, May 8th; autumn, September 21st to October 25th.

Similar in habits to the Song Sparrow, but much wilder and shyer. Thurber mentions it as of rare occurrence in Morris county, but on September 21st, 1885, he saw ten,[1] and Babson records four specimens obtained near Princeton, as follows:

October 25th, 1875. W. E. D. Scott.
September 21st, 1878. W. E. D. Scott.
October 7th, 1879. W. E. D. Scott.
May 8th, 1894. H. A. Phillips.

Mr. Chapman saw one at Englewood, September 10th, 1898.[2]

584 Melospiza georgiana (Latham).

Swamp Sparrow.

PLATE 58.

Adults.—Length, 5.50. Wing, 2.35. Above, brown, broadly streaked with black; gray on the back of the neck; crown, uniform chestnut; forehead, black, with a short gray median streak; sides of head and neck and entire

[1] O. and O., XI., p. 92.
[2] Abst. Proc. Linn. Soc., N. Y., XI., p. 5.

breast, gray; flanks, brown; throat and middle of abdomen, dull white; wing-coverts and tertials edged with chestnut. In winter the chestnut crown is more or less obscured by black.

Young in first autumn.—Similar, but crown mainly blackish, with a trace of chestnut here and there; sides of face, yellowish; under parts tinged with buff.

Young in first summer.—Cinnamon brown above, streaked with dusky; below, buffy-white, narrowly streaked with black on throat, breast and sides.

Nest of grass in a tussock; eggs, four to five, pale bluish-green, thickly blotched with brown, .75 x .55.

Common summer resident in suitable localities. Resident in the southern counties, especially Cape May. Migrants arrive March 29th, depart November 1st.

The Swamp Sparrow is an inhabitant of low swamps, especially along the Delaware and near the coast. It is a shy bird, rather difficult to flush, and runs along dodging in and out under the tussocks of grass like a mouse.

Its song is a repetition of one note, "sweet, sweet, sweet, sweet," with a sort of liquid quality like that of the Long-billed Marsh Wren, with which it associates.

In midwinter I have found these birds plentiful in the neighborhood of Cape May, and they occur occasionally farther north at this season.

585 Passerella iliaca (Merrem).

Fox Sparrow.

PLATE 56.

Adults.—Length, 6.25–7.50. Wing, 3.50. Above, rusty, the gray bases of the feathers showing through and producing a somewhat mottled appearance; tail and wing edgings, bright rusty; two narrow white wing bars; under parts, white, heavily spotted on throat and breast with bright rusty triangular spots; sides and lower breast with small dark brown spots; flanks with long streaks of brown and rusty.

Common transient visitant. Spring, March 1st (March 8th) to April 10th; autumn, October 15th to December 1st. A few winter.

This is the largest and rustiest of our Sparrows. While he is with us he frequents the edges of swampy thickets, usually in flocks of varying sizes, scratching about among the leaves and flying to the trees or bushes when disturbed.

In spring the Fox Sparrow may often be heard in full song, and a splendid song it is, finer in quality than that of any of our other Sparrows.

Though common every year during their passage, they seem, some years, to reach us all together, as it were, and for a short time the thickets simply swarm with them. I noticed such a flight in March, 1906, near Tuckerton, when all the woods and fence rows seemed alive with Fox Sparrows.

Mr. W. E. D. Scott secured one on January 14th, 1879, at Princeton,[1] and Mr. S. N. Rhoads and I found several at Cape May, January 26th-29th, 1891. Mr. Baily[2] saw twenty-five at Wildwood, December 25th, 1902, and Mr. W. B. Evans one at Moorestown the same day.[2]

587 Pipilo erythrophthalmus (Linnæus).

Towhee, Chewink.

PLATE 60.

Adult male.—Length, 7-8.25. Wing, 3.10. Above, including whole head, neck and breast, black; sides of body, chestnut; middle of body, white; outer web of primaries white at base, making a distinct bar; tips of primaries and tertials also white; three outer tail feathers with large white terminal areas, fourth feather often with a small white spot.

Adult female.—Similar, but black replaced by brown (cinnamon or raw umber).

Young in first summer.—Above, fulvous brown, streaked and mottled with black; under parts, buffy, thickly streaked with blackish, except on the throat and middle of the abdomen; wings and tail as in adults.

Nest of dead leaves lined with grass, placed on the ground, or rarely in a low bush; eggs, four to five, white, spotted with brown, .90 x .70.

Common summer resident. Arrives March 21st (April 19th), departs October 20th. Mr. W. L. Baily has recorded one at Wildwood, Cape May county, December 27th, 1903,[3] and W. B. Evans one at Moorestown, December 25th, 1907.[4]

The Towhee is a bird of clearings or low bushy woodlands, and spends most of his time scratching among the dead leaves. When alarmed he utters the familiar metallic "che wink" and flits about from

[1] Bull. Nutt. Orn. Club, 1879, p. 82.
[2] Bird Lore, February, 1903.
[3] Cassinia, 1904, p. 62.
[4] Bird Lore, February, 1908, Christmas Lists.

bush to bush, and back to the ground, exhibiting his black, white and brown colors to perfection.

When singing he perches motionless on the top of some bush or low tree and at intervals utters the notes which Thompson Seton so clearly represents with the syllables "chuck-burr, pill-a-will-a-will-a."

The Towhee is pretty generally distributed, but is particularly plentiful in the pine barrens of which section it is one of the characteristic species.

593 Cardinalis cardinalis (Linnæus).

Cardinal.

PLATE 61.

Adult male.—Length, 8–9. Wing, 3.75. Whole plumage, vermilion red, except the throat, forehead and area at base of bill, which are black; back feathers edged with grayish; a conspicuous crest on the head; bill, red.

Adult female.—Above, grayish-olive; below, pale fulvous or buff; wings and tail, dull red, as in male; throat, etc., dull grayish.

Young in first summer.—Similar to adult female, but males show more or less red in the plumage.

Nest of grapevine bark and dead leaves, lined with rootlets and grass, in bushes, three to four feet up; eggs, three to four, white, spotted with brown, 1.00 x .70.

Common resident in the southern half of State and along the eastern border to the vicinity of New York City.

This is one of our really brilliant birds, but, in spite of his red coat, he is not nearly so conspicuous as one might suppose, and those who are familiar with him note his presence by his call more frequently than by his color. He has a loud clear whistle, somewhat resembling the syllables "woit, woit, woit, woit," repeated rapidly and at other times a more deliberate "cheer, cheer, cheer." The Cardinal is a bird of low thickets, and is active and inquisitive, flitting about from place to place with crest erect, and showing a great display of rivalry when one imitates his call.

It seems strange to see such an apparently tropical bird in the depth of winter, and yet all through southern New Jersey, especially along the tide-water creeks, he is just as plentiful when the ground is covered with snow as in midsummer.

In the northern counties he does not occur, but breeds at least as far

north as Plainfield (common, Miller), Summit (rare, Holmes); at South Orange Mr. Babson writes me that he has found two nests, and Mr. H. B. Bailey[1] records another. At Morristown Thurber calls it rare, and Mr. Caskey has never seen it.

595 Zamelodia ludoviciana (Linnæus).

Rose-breasted Grosbeak.

PLATE 62.

Adult male.—Length, 8.20. Wing, 4. Head, throat and back, black; rump, white, tipped with black; wings and tail, black, tipped or marked with white; breast and under wing-coverts, bright pink; rest of under parts, white.

Female.—Above, brown, streaked with gray and buff; a buff line down the center of the crown and white line over the eye; below, buff, streaked with brown; under wing-coverts, orange-yellow; wings and tail, brown.

Young in first autumn.—Similar to female, but under wing-coverts pink.

Nest in bushes or low trees; eggs, three to four, greenish-blue, spotted with reddish-brown, 1.00 x .75.

Common summer resident in the northern counties; transient visitant in the south; breeds at Princeton (Babson), near Trenton (Abbott), Plainfield (Miller), Summit (Hann and Callender), Paterson (Clark), Hopatcong (Dwight), Ridgewood (Hales), Hudson Valley (Chapman); also one nest at Haddonfield, July, 1897,[2] and one at Beverly, June 1st, 1896.[3] William B. Evans also heard the bird in full song at Bridgeboro, Burlington county, June 24th, 1901, and at Mount Holly, July 20th, 1901.[4] Mr. Clarence Brown found a single bird at Rutherford from January 26th to February 13th, 1908, a remarkable occurrence. The bird was photographed when it came for food, making identification certain.[5]

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[1] Auk, 1886, p. 410.
[2] Moore, Abst. Proc. D. V. O. C., III., p. 10.
[3] Reed, Auk, 1897, p. 323.
[4] Cassinia, 1901, pp. 32–34.
[5] Bird Lore, 1908, p. 82.

597 Guiraca cærulea (Linnæus).

Blue Grosbeak.

Adult male.—Length, 7. Wing, 3.50. General color, bright blue, shaded with dusky on the middle of the back; wings and tail, black, edged with blue; shoulder of wing, chestnut, as are also the tips of the tertials and greater-coverts.

Female.—Pale brown, drab on the lower back, still paler below; two obscure wing bars.

Nest in bushes; eggs, three to four, plain bluish-white, .85 x .65.

Audubon describes in detail a nest with young which he found near Camden in the summer of 1829, and which appears in the plate of this species in his Birds of America.

Turnbull calls it a rare straggler in New Jersey, possibly entirely on Audubon's authority.

Thurber (1887) says that it has been seen at Morristown by Mr. Fairchild, and Mr. E. P. Bicknell records several individuals noticed by Mr. Akhurst, a taxidermist, near Snake Hill, N. J., in the vicinity of New York City.

These meagre records constitute all that we know of the bird in New Jersey.

598 Passerina cyanea (Linnæus).

Indigo Bunting, Indigo-bird.

PLATE 63.

Adult male.—Length, 4.75–5.75. Wing, 2.60–2.80. Above and below, bright cerulean blue, more purplish on the head; wings and tail, black, edged with blue. *In autumn.*—Rich brown, paler on the breast and abdomen; feathers everywhere with blue bases, which are more or less apparent; wings and tail edged with blue.

Adult female.—Above, dull brown, with an olive tinge; below, whitish, somewhat tinged with buff and obscurely streaked with dusky on the breast and sides.

Young in first summer and autumn.—Similar to adult female.

Male in first breeding season.—Blue, more or less mottled with worn brown feathers above and white ones below.

Nest of grass and dead leaves in a crotch of a bush, three or four feet up; eggs, three to four, bluish-white, .75 x .52.

Common summer resident. Arrives May 1st (May 7th), departs October 1st.

The Indigo-bird is one of our most persistent songsters. No summer day seems too hot for his performance, and while other species await the cool of the approaching evening, he pours forth his energetic song full in the boiling sun, perched on some tree or telegraph wire.

His brilliant plumage is not perceptible against the sky, and it is only when we find him near the ground that we get a background that shows us his true colors. The Sparrow-like female may be recognized by the plain brown coloration and the faint trace of blue on the shoulders and tail. The Indigo is a bird of the fields, clearings, and edges of woodland, though he comes now and then into the garden.

601 Passerina ciris (Linnæus).

Painted Bunting, Nonpareil.

Adult male.—Length, 5.25. Wing, 2.70. Head and neck, blue; back, green, tinged with golden yellow; rump and under parts, red; wings and tail washed with red; greater wing-coverts, green.

Female.—Olive-green above; white, tinged with yellow, below; wings and tail washed with green.

Accidental straggler from the south.

One is recorded by Mr. E. P. Bicknell in the Elliot collection in the American Museum, labeled "New Jersey," [1] and Professor A. H. Phillips took one at Princeton, July 6th, 1897.[2] It is probable that these may have been escaped cage birds.

604 Spiza americana (Gmelin).

Dickcissel, Black-throated Bunting.

Adult male.—Length, 5.75–6.50. Wing, 2.80–3.25. Above, grayish-brown, streaked with black on the back; rump and crown, gray; a pale yellow line over the eye; lesser wing-coverts, bright cinnamon rufous; under parts, yellow, fading into white on the abdomen and chin; a black patch on the lower throat.

Adult female.—Similar, but paler; whole throat, white; no black patch.

Young in first summer.—Clay colored, coarsely striped with black above; below, pale buff.

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[1] Bull. Nutt. Orn. Club, III., 1878, p. 132.

[2] Babson, Birds of Princeton, p. 66.

Young in first autumn.—Similar to adult female, but buffy-white below, brownish on the sides.

Nest of grass on the ground or in low bushes; eggs, four to five, pale blue, unspotted, .80 x .60.

Formerly a local summer resident, but now rare and of irregular occurrence.

Up to 1860, and locally later, this bird was of regular occurrence on the Atlantic coastal plain, but during the next twenty years it practically disappeared from this region and is now restricted to the Mississippi Valley, except in the case of occasional stragglers.

The late Dr. S. W. Woodhouse wrote to Mr. Rhoads (Cassinia, 1904, p. 23) that from 1840 to 1850 it was common in Camden county, and Mr. C. S. Galbraith informed Mr. Chapman[1] that in 1851 it was a common summer resident at Hoboken. Audubon mentions that it was plentiful at Salem in his time, but that it did not occur in the more sandy parts of the State. So common was it that most early authors did not take the trouble to mention, in detail, the localities in which they had found it, and so the above constitute practically all that we have of the original distribution of the bird in New Jersey.

In 1868 Dr. C. C. Abbott[2] reported it as a rare migrant, and we have, then, no record of its occurrence until the capture of a male June 4th, 1880, at Princeton, by J. F. Cowan, and two at Stoutsburg, June 14th, of the same year, by W. E. D. Scott, all in Princeton College Collection (Babson). One young bird, shot at Maurice River, September 18th, 1890, was obtained by Mr. W. L. Baily from a Reedbird gunner, and this closes the record of the bird in New Jersey until 1904, when we have the startling fact of its breeding again in the State.

Mr. W. D. W. Miller, of the American Museum of Natural History, New York, found a pair of birds evidently at home in a grass field near Plainfield, July 3d, 1904, and the next day discovered two young, one of which was secured. The bird apparently did not return to the vicinity in the following years, so the hope that this might be the beginning of the bird's return to its former home has not been realized.

Mr. S. N. Rhoads has discussed the disappearance of this bird quite fully in his paper "Exit the Dickcissel" (Cassinia, 1903, pp. 17-28).

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[1] Auk, 1891, p. 395.

[2] Birds of N. J. in Cook's Geol. of N. J.

Family TANGARIDÆ.

THE TANAGERS.

A family of tropical birds of which only two species find their way to Eastern North America. Allied to the Finches, but upper mandible slightly toothed near the middle. Habits arboreal.

a. More or less red in the plumage (males).	
b. Wings and tail black.	SCARLET TANAGER, p. 248
bb. Wings and tail at least partly red.	SUMMER TANAGER, p. 249
b. No red in plumage (females).	
b. General tone of upper parts buffy-olive.	SUMMER TANAGER, p. 249
bb. General tone of upper parts olive-green.	SCARLET TANAGER, p. 248

608 Piranga erythromelas Vieillot.

Scarlet Tanager.

PLATE 64.

Adult male.—Length, 6.50–7.50. Wing, 3.75. Entire plumage, brilliant scarlet, except wings and tail, which are jet black. In autumn the scarlet is replaced by olive-green above and citron-yellow below, wings and tail remain the same. The seasonal change from red to green, and *vice versa*, continues throughout the bird's life.

Adult female.—Pale olive-green above, greenish-yellow below; wing-coverts uniform with the back; wings and tail, dusky, edged with olive.

Young in first summer.—Above, yellow-olive; below, dull white, becoming yellow on the abdomen, streaked with olive-brown on the breast and sides.

Young male in first autumn.—Similar to adult female, but wing-coverts black; the rest of the wing and tail is dusky with olive edgings in contrast to the uniform black wing of the adult male.

Male in first breeding season.—Similar to last, but scarlet instead of green; wings usually remain the same, but some jet black feathers often appear in the tail.

Nest on the branch of a tree, frail, composed of rootlets, etc.; eggs, three to four, greenish-blue, spotted with brown, .95 x .65.

Tolerably common summer resident. Arrives April 28th (May 6th), departs October 10th. More abundant in the northern counties.

In early May the Tanagers are conspicuous in the woods, shining out like coals of fire among the white dogwood blossoms and gray-green of the opening leaf buds. Later, when the transients have

passed on, the summer resident Tanagers take to the tree-tops, and in the thick foliage we see them less frequently, but their powerful song comes down to us from the topmost bow or floats out across the fields from the distant woodland. It resembles very much the chant of the Robin, but has a peculiar harsh quality that renders it easily recognized. In autumn we find the Tanagers, then all in dull green, associating with the mixed flocks of birds that feed on the sour gum and dogwood berries.

610 Piranga rubra (Linnæus)

Summer Tanager.

Adult male.—Length, 7–8. Wing, 3.75. Above, dull poppy red, brighter, more vermilion on the under parts.

Adult female.—Above, yellowish olive-green; below, dull yellow.

Young in first summer.—Above, yellowish-brown; below, dull white, tinged with yellow and streaked with olive-brown.

Young in first autumn.—Similar to adult female, but brighter and more tinged with orange.

Male in first nesting season.—Sometimes similar to adult, but with wings edged with olive instead of red; other birds have only a scattering of red feathers over the body, and there are all sorts of intermediates; the full red plumage is always assumed at the end of the first nesting season and is not afterwards changed to olive.

Nest and eggs similar to those of the preceding.

A very rare straggler from farther south.

Formerly this bird was of regular occurrence in summer in southern New Jersey. Wilson says: "In Pennsylvania they are a rare species, while in New Jersey, even within half a mile of the shore opposite the city of Philadelphia, they may generally be found during the season" [May to August]. This was in 1807. In 1857 Beesley gives it as a rare breeder in Cape May county, and in 1869 Turnbull lists it as rather rare. Mr. G. N. Lawrence (1866) says he saw it in magnolia swamps near Atlantic City, but no farther north.[1] Dr. C. C. Abbott in 1868 says that up to 1850 it was as abundant as the Scarlet Tanager, but that he had seen no nest since 1855, and no bird since 1862. Writing in 1870,[2] he extends its period of abundance to 1857, and in 1886[3] records a pair nesting near Trenton in June, 1884. While Dr. Abbott's statement about the bird's abundance prior to 1850

[1] Ann. N. Y. Lyc., VIII., p. 286.
[2] Am. Nat., IV., p. 536.
[3] Upland and Meadow, p. 118.

can hardly be based upon personal observation, his statements, nevertheless, constitute the bulk of our knowledge of its decrease in the State. Later we have only John Krider's statement that he had taken the nest in former years in New Jersey; Thurber's (1887) mention of it as an accidental visitant to Morristown, and the record of a young bird taken by Mr. W. E. D. Scott at Princeton, August 5th, 1880.[1]

In spite of the fact that I pointed out the true status of this species in southern New Jersey in 1894,[2] it is recorded as a breeding species in this section in numerous general works published since that date, even as recently as 1906 in Chapman's Birds of the Vicinity of New York City.

Family HIRUNDINIDÆ.

The Swallows.

Swallows are wonderfully adapted to the life they lead; long, narrow wings, suitable for rapid flight; a large mouth, with very short bill, suitable for gulping down such insects as come in its way, and small feet, which are only needed when alighting on the nest or on some ridge pole, branch or telegraph wire.

While the form of the various species is very similar, their nesting habits vary a great deal.

a. Wing over 5.50. — Purple Martin, p. 251
aa. Wing under 5.
  b. Back glossy blue or green.
    c. Throat white. — Tree Swallow, p. 253
    cc. Throat rusty.
      d. Tail forked. — Barn Swallow, p. 252
      dd. Tail square. — Cliff Swallow, p. 251
  bb. Back dull brown; little, if any, gloss.
    c. Rump rusty. — Cliff Swallow (young), p. 251
    cc. Rump uniform with the back.
      d. Entire under parts white. — Tree Swallow (young), p. 253
      dd. Throat and breast ashy, abdomen white. — Rough-winged Swallow, p. 255
      ddd. Throat and abdomen white, with a dusky breast band. — Bank Swallow, p. 254

[1] Babson, Birds of Princeton, p. 67.
[2] Birds of E. Pa. and N. J., p. 122.

611 Progne subis (Linnæus).

Purple Martin.

PLATE 65.

Adult male.—Length, 8. Wing, 5.75. Above and below, uniform glossy violaceous steel-blue; flight feathers, dull black.

Adult female.—Above, duller and mixed with gray; under parts, sooty gray; breast, abdomen and crissum, white, more or less narrowly streaked with black.

Young in first summer.—Sooty brown above, head and back slightly glossed with steel-blue; below, mouse-gray on throat, breast and sides; on abdomen, white, narrowly streaked with black.

Young male in first summer.—Similar, but darker. *In first breeding season.*—Like adult female, but with some glossy steel-blue feathers scattered here and there.

Nest mainly in boxes erected for its use, to which it carries twigs, straw, etc.; eggs, four to five, white, .95 x .65.

Common summer resident in the southern counties, but locally distributed; rare northward. Arrives March 29th, departs September 1st.

The Martins are not governed in their distribution by the presence of Martin boxes, for many an attractive box has been erected in vain, while in other places any sort of cover, even the hood of an electric light, has proved satisfactory.

Colonies occur all along the seaboard and throughout the pine barren wilderness, in which districts some curious make-shift of boxes are to be seen, but in the other parts of the State they are rare or only stragglers.

The Martins make a great disturbance while the young are being raised, and later the whole colony may be seen scouring the meadows for food.

612 Petrochelidon lunifrons (Say).

Cliff Swallow, Eave Swallow.

Adults.—Length, 5–6. Wing, 4.25. Above, head and back, glossy steel-blue, the back streaked with whitish; rump, cinnamon rufous; wings and tail, dull black; forehead, pinkish or rusty; sides of face and throat, chestnut; center of throat, glossy steel-blue; breast and sides, grayish-brown, tinged with chestnut; middle of abdomen, white; under tail-coverts, dusky, edged with white.

Young in first summer.—Above, dull brownish-black, slightly glossed with blue on the back and head; rump, cinnamon rufous, and tertials tipped with the same; sides of face, dull black, throat largely the same, but mottled with

cinnamon and white feathers; sides of breast, body, flanks and crissum, cinnamon, somewhat streaked with black; center of abdomen, white.

Nest of mud shaped like a retort or with a hole in the side, lined with feathers; eggs, four to five, white, spotted with reddish-brown, .80 x .55.

Tolerably common transient and local summer resident, especially in the pine barrens. Arrives April 29th, departs September 1st.

The Cliff Swallow nests in colonies usually under the eaves of a barn. It is decidedly local and is generally reported to be less abundant than it was thirty or forty years ago.

It nests at several localities in Cape May, Cumberland and Burlington counties, and nested near Princeton up until 1896[1] (Babson). At Plainfield Mr. Miller reports a few nesting every year, while Mr. Hales[2] reports it at Ridgewood, and Mr. Thurber at Morristown. Mr. S. N. Rhoads found it plentiful at Greenwood Lake and the Wallkill Valley, June, 1909. Mr. Crispin says it formerly bred at Salem.

613 Hirundo erythrogaster Boddært.

Barn Swallow.

PLATE 66.

Adults.—Length, 6–7.50. Wing, 4.75. Above, glossy steel-blue; forehead, chestnut; outermost tail feathers elongated, all but middle pair, with a conspicuous white subterminal spot on the inner web; under parts, light cinnamon rufous, deeper and more chestnut on the throat and breast, the steel-blue coming around on the sides of the breast forming a half collar.

Young in first summer.—Similar, but much duller; forehead, gray; sides of head and collar, blackish; outer tail feathers only a little elongated; subterminal spots more or less chestnut; under side much paler.

Nest of mud lined with grass and feathers plastered against a rafter in a barn or stable; eggs, four to six, white, spotted with brown or rusty, .80 x .55.

Common summer resident. Arrives April 10th (April 23d), departs September 10th.

This is our most familiar Swallow, and there is scarcely a barn that has not one or more pairs, flying in and out twittering as they go.

Later we see whole families sailing low over the ponds or meadows, feeding on the wing as is the custom of their kind.

The rusty color of the under parts distinguishes them from all but the Cliff Swallow, while the forked tail is in strong contrast to the nearly square tail of that species.

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[1] Birds of Princeton, p. 67.

[2] Bird Lore, 1906, p. 173.

614 Iridoprocne bicolor (Vieillot).

Tree Swallow, White-bellied Swallow.

PLATE 67.

Adults.—Length, 5–6. Wing, 4.75. Above, bright glossy greenish steel-blue; lores, black; under surface, pure white. In autumn the tertials are broadly tipped with white.

Young in first summer.—Above, mouse-gray, tertials tipped with brownish-white; below, white, often with a shade of gray across the breast.

Nest in holes in trees, often old Woodpeckers' holes, made of grass and feathers; eggs, four to six, white, .75 x .50.

Common transient visitant, and summer resident in the pine barrens, and of occasional occurrence in winter. Arrives April 8th (April 22d), departs October 15th.

The Tree Swallows are seen at their best along the seacoast during August and September,[1] when they collect by thousands, circling about over the marshes, and now and then resting on the telegraph wires, where they sit close together, lining the wires as far as the eye can reach, or settling down on bayberry bushes to feed on the waxy-covered fruit. This, as far as I am aware, is the only departure from an insectivorous diet on the part of our Swallows. Mr. Chapman[2] says that they occur on the Hackensack marshes, July 20th to October 20th, roosting in the cat-tails. At Cape May Mr. Hand tells me they often roost in shade trees, and on September 16th, 1903, were nearly drowned out, some six thousand drenched birds being down on the ground, temporarily unable to fly.

Through the pine barrens, along the larger rivers and about swampy ponds the Tree Swallow nests regularly, preferring the half-rotten trees that grow in the water, but there seems to be no breeding record for the northern half of the State, the most northern record being Mr. Babson's[3] mention of three pairs nesting on Millstone Creek, near Princeton, June 16th, 1900, and again the following year.

In Cape May county Mr. H. Walker Hand informs me he has seen them some years all winter, especially about Lilly Lake, Cape May Point.[4]

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[1] *Cf.* Childs, Auk, 1900, p. 67.
[2] Birds Vicinity of N. Y., p. 175.
[3] Birds of Princeton, p. 68.
[4] *Cf.* also Cassinia, 1904, p. 68.

Mr. F. M. Chapman[1] records a flock at Englewood, December 31st, 1882, and W. E. D. Scott[2] saw them at Squan Beach, November 16th, 1880.

616 Riparia riparia (Linnæus).

Bank Swallow.

PLATE 65.

Adults.—Length, 4.75–5.50. Wing, 4. Above, plain grayish-brown, darker on the head; under surface, white, with a grayish-brown band across the breast.

Young in first summer.—Similar, but lower back, rump and breast band, and inner wing feathers edged with whitish.

Nest of grass and feathers at the end of a tunnel-like hole dug by the bird in the face of a sand bank; eggs, four to six, white, .70 x .50.

Common local summer resident where suitable nesting sites are available. Arrives April 14th (April 19th), departs September 1st.

The Bank Swallow is a sociable bird, nesting in large communities, the entrances to their nests forming row upon row of holes on the face of some large sand bank, in front of which the birds fly back and forth uttering their characteristic weak cries.

From the fact that available nesting sites are not very plentiful, the birds are rather local in distribution, and usually occur more frequently along creeks and rivers which have steep perpendicular banks suitable to their needs. In south Jersey they occur mainly along the Delaware Valley.

In late summer the Bank Swallow associates to some extent with the other species that gather in great flocks prior to their migration southward.

They are dull brown, like the Rough-wing, but the dusky breast band, contrasting with the white throat and belly, easily distinguishes them.

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[1] Auk, 1889, p. 303.

[2] Bull. Nutt. Orn. Club, 1881, p. 115.

617 Stelgidopteryx serripennis (Audubon).

Rough-winged Swallow.

Adults.—Length, 5.50. Wing, 4.50. Above, uniform plain brown; under surface, white, pale gray on the throat, breast and sides; outer edge of outermost wing feathers rough to the touch, owing to the stiffened reflexed barbs.

Young in first summer.—Similar, but strongly suffused with cinnamon above and below; wing-coverts and tertials broadly tipped with cinnamon.

Nest of grass and feathers in a hole in a bank or in bridge abutments or a stone wall; eggs, four to seven, white, .75 x .52.

Tolerably common summer resident as far north at least as Plainfield. Arrives April 13th (April 19th), departs September 1st.

This is a bird of Carolinian fauna; rare or local in the northern counties of the State. They are usually seen in pairs about bridges or quarries, and are distinguished by their dull brown color and plain breasts.

They nest at Princeton (Babson), Plainfield (Miller), the lower Hudson Valley (Chapman), and Paterson (J. H. Clark); also occasionally at Morristown (Thurber) and Summit (Holmes). Mr. Chapman also found them breeding on the upper Delaware at High Knob, June 10th, 1890.

Family BOMBYCILLIDÆ.

The Waxwings.

618 Bombycilla garrula (Linnæus).

Bohemian Waxwing.

Adults.—Length, 7.50–8.50. Wing, 4.50. Similar to *B. cedrorum* in general appearance but grayer, with a conspicuous black throat; chestnut patches on the forehead and crissum and with yellow and white tips to the wing feathers, in addition to the wax-like appendages of the secondaries.

Exceedingly rare winter visitant. Dr. C. C. Abbott (1868)[1] records having seen two specimens shot in New Jersey, one in Cape May county the other in Morris county. In 1884[2] he records two specimens

[1] Birds of N. J.

[2] Naturalist's Rambles about Home.

shot many years ago, both "in Mercer county." Mr. T. M. Trippe records a pair "observed" in the vicinity of Orange, April 28th, 1867.[1]

So rare is this bird in New Jersey that its only claim to a place in the avifauna of the State rests entirely upon the above statements. None have been seen for at least forty years, and even the specimens mentioned above cannot be verified, as they were not taken by their recorders. It is not clear that Mr. Trippe was the one who "observed" the birds he records, while the date given seems hardly possible, and we are in doubt whether Dr. Abbott's two statements refer to the same birds or not.

619 **Bombycilla cedrorum** Vieillot.

Cedar Waxwing, Cedar-bird.

PLATE 68.

Adults.—Length, 6.50–7.50. Wing, 3.75. Above, soft grayish olive-brown, more pinkish on the head, which has an erectile crest; rump, gray; wings and tail, blackish, shaded and edged with gray; tail with a broad terminal band of bright yellow on all the feathers; secondary wing feathers with curious bright red elongations of the shafts resembling tips of sealing wax; tail feathers and primaries occasionally bearing similar appendages; breast and throat, pinkish-brown, like the crown; abdomen, pale olive-yellow; crissum, white; a jet black band across the forehead and through the eye, narrowly bordered with white across the forehead and below from the base of the bill; chin, black.

Young in first summer.—Similar, but grayer, and broadly streaked with olive-brown on the sides, breast and flanks.

The development of the wax-like tips is independent of age or sex, though they are less frequently found in the young and females.

Nest of grass, shreds of bark, etc., and usually with some mud in its composition, placed in a tree ten to thirty feet from the ground; eggs, three to five, light drab or blue-gray, spotted with black, .85 x .60.

Common summer resident and of irregular occurrence in winter. Apparently breeds more abundantly in the northern counties.

The Cedarbird is most familiar to us in the great flocks which sweep down into the cherry trees in June, with faint wheezy notes that are hard to describe and have more the quality of an insect note than of bird music. At this season, when most birds are busy raising families, they are intent on feeding with apparently no thought of nest or young. Before the month is over the flocks drift away again, leaving only a

[1] Amer. Nat., II., p. 380.

few nesting pairs which are not very conspicuous in our summer bird life.

In autumn, winter and early spring we again see the vagrant flocks of Cedarbirds alighting on the tree tops, sitting upright with crests erect for a moment or two and then whirling away with a few sighing notes.

Mr. Chapman records a nest, with eggs, as late as September 13th.[1]

Family LANIIDÆ.

THE SHRIKES.

A family peculiar, among Passerine birds, for their raptorial habits of its species. The strong hooked and notched bill recalls that of a Hawk.

Our two species belong to the typical Shrikes, and are distinctly beneficial birds, feeding on mice and grasshoppers for the most part.

a. Wing, 4.35–4.60. NORTHERN SHRIKE, p. 257
aa. Wing, 3.75–4. MIGRANT SHRIKE, p. 258

621 Lanius borealis Vieillot.

Northern Shrike, Butcher-bird.

PLATE 69.

Adult male.—Length, 9.50–10.50. Wing, 4.50. Above, plain blue-gray, white on the rump, forehead and some of the scapulars; wing and tail, black; secondaries tipped with white; outer tail feathers, white, others tipped with white in decreasing amount, sometimes lacking on the central pair; under surface, white; chest and sides of body more or less mottled with narrow dusky vermiculations; ear region and spot in front of the eye, black.

Adult female.—Duller in color.

Young in first autumn.—Brownish-gray above, head markings, wings and tail dusky instead of black; dusky vermiculations much more extensive, covering the rump and all the lower surface, except the chin and lower abdomen.

Rather scarce, but apparently regular, winter visitant. December 2d to March 1st.

While with us the Shrike is a solitary bird. We see him perched on the top of some thorn bush on the meadow, or on a tall tree in the

[1] Abst. Proc. Linn. Soc., N. Y., 1890, p. 2.

pasture, his gray and black colors showing clearly in the sunlight. Then he flies, and the white patches on the rapidly moving wings at once catch the eye. As he nears his new perch he flies low and turns sharply upwards as he comes to rest.

The feeding habits of the Shrikes are peculiar, they being the only raptorial birds among our passerine species. They not only catch and kill various mice and sometimes small birds in addition to the usual beetles and grasshoppers, but impale them on sharp thorns or wedge them into the fork of a branch, where they are said to frequently leave them and return to the hunt, though they often devour them on the spot.

622e Lanius ludovicianus migrans Palmer.

Northern Loggerhead Shrike.

Adults.—Length, 8.50–9.50. Wing, 3.80. Above, plumbeous gray, paler on the rump, some of the scapulars white; wing and tail feathers, black; white tips to the secondaries and to all but the two middle pairs of tail feathers; under parts, white, slightly shaded with gray on the sides; a black patch on the side of the head, involving the region about the eye and ear.

Young in first winter have wing and tail duller, not jet black, and sometimes show traces of dusky vermiculations on the breast.

Rather irregular migrant, especially in the southward flight; August to December.

This bird occurs singly, as a rule, during August and September, though occasional in winter (December and January).

The following have been recorded:

A number taken at Princeton, New Brunswick and Barnegat, August, 1878; January, 1879; W. E. D. Scott.[1]

Mt. Ephraim, near Haddonfield; October 20th, 1884. S. N. Rhoads.[2]

Tappan; August 24th, 1888. F. M. Chapman.[3]

Cape May; August, 1890 and 1891. W. Stone.[2]

Cape May Point; May, 1892. W. Stone.[4]

Leonia; September 27th, 1898.[5]

Ocean View; April 30th, 1901. W. L. Baily.[6]

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[1] Bull. Nutt. Orn. Club, IV., p. 82.
[2] Stone, Birds of E. Pa. and N. J., p. 125.
[3] Auk, 1889, p. 304.
[4] Abst. Proc. D. V. O. C., II., p. 4.
[5] Abst. Proc. Linn. Soc., N. Y., XI., p. 5.
[6] Cassinia, 1901, p. 48.

Family VIREONIDÆ.

The Vireos.

A group of small, dull-colored birds resembling the wood warblers in habits, and often associating with them. They are, however, more deliberate in action, and in structure differ in their hooked bill, which resembles that of the Shrike, though of course it is much smaller.

The Vireos are entirely insectivorous and worthy of careful protection. The nests are readily recognized, being basket-like pensile structures swung from a forked branch.

a. Eye ring more or less bright yellow.
  b. Breast and throat bright yellow, abdomen white.
    Yellow-throated Vireo, p. 261
  bb. Breast and abdomen white, flanks pale yellow. White-eyed Vireo, p. 262
aa. No yellow about the eye.
  b. White line from the bill to the eye and a white eye ring.
    Solitary Vireo, p. 261
  bb. A white line from the bill over the eye and along the side of the crown.
    c. White line bordered above with black. Red-eyed Vireo, p. 259
    cc. White line not bordered with black.
      d. Lower parts grayish-white. Warbling Vireo, p. 260
      dd. Lower parts pale yellow. Philadelphia Vireo, p. 260

624 Vireosylva olivacea (Linnæus).

Red-eyed Vireo.

PLATE 70.

Adults.—Length, 5.50–6.50. Wing, 3.25. Above, grayish olive-green; top of head, mouse-gray, a white line from the bill over the eye, bordered with black where it joins the crown, and a dusky streak through the eye; under parts, white.

Young in first summer.—Above, pale drab; below, white; wings and tail, olive, as in the adult.

Nest a pensile structure of fine pieces of bark, paper and rotten wood, and almost always with pieces of thick white spider web on the outside; hung from a fork at the end of a branch usually ten to twenty feet up; eggs, three to four, white, with a few brown or black spots on the larger end, .85 x .55.

Abundant summer resident. Arrives April 30th (May 6th), departs October 10th.

The Red-eye is our commonest Vireo, one or more pairs occurring in every piece of woodland, except in the dry pine barrens. He is a most persistent singer, keeping up his deliberate warble throughout the day. Wilson Flagg admirably describes the song as "You see it—you know it—do you hear me—do you believe it?" There is a pause between each sentence as if the bird were conducting a sort of argument; a peculiarity that has earned him the name "Preacher-bird" in some places. The actions of the Vireo are quite as deliberate as his song; he goes along the twigs in a matter-of-fact fashion, turning his head first on one side then on the other, stopping to pick up a bug or a caterpillar and then, wiping his bill on the limb, continues on his search.

626 Vireosylva philadelphica Cassin.

Philadelphia Vireo.

Adults.—Length, 4.75. Wing, 2.50. Above, grayish olive-green, gray on the head; a dull whitish streak over the eye and a dusky streak through it; under parts, dull sulphur yellow.

In autumn the gray crown is less distinct.

Very rare transient visitant.

The following are the only records of its capture:

Princeton; September 21st, 1876. W. E. D. Scott (Princeton Coll.).[1]

Princeton; September 28th, 1876. W. E. D. Scott (Princeton Coll.).[1]

Anglesea; September 21st, 1889. H. Wenzel (P. Laurent Coll.).[2]

627 Vireosylva gilva (Vieillot).

Warbling Vireo.

Adults.—Length, 5–5.50. Wing, 2.75. Above, light mouse-gray, faintly tinged with olive on the back and rump; a whitish line from the bill over the eye; under parts, white, tinged with olive on the sides. In autumn, greener on the back and yellower on the sides; sides of breast, buffy-olive.

Young in first summer.—Above, wood brown; white below, tinged with yellow on the crissum.

Nest pensile, resembling that of the Red-eye; eggs, three to four, white, with a few black specks at the larger end, .72 x .52.

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[1] Babson, Birds of Princeton, p. 70.

[2] O. and O., 1892, p. 89.

Common, but local summer resident. Arrives May 2d (May 6th), departs September 25th.

The Warbling Vireo is a bird of the shade trees of the village streets and lawns, with the habits of other Vireos, but an entirely different song; a fine continuous warble, recalling somewhat the song of the Orchard Oriole, a bird of similar surroundings. It is more or less local and apparently more plentiful in the northern half of the State. Mr. F. M. Chapman found it at High Knob, Sussex county, and it is abundant in the Wallkill Valley (Rhoads).

628 **Lanivireo flavifrons** (Vieillot).

Yellow-throated Vireo.

Adults.—Length, 5–5.75. Wing, 3. Above, yellowish-olive; scapulars, rump and upper tail-coverts, gray; wings and tail, black, most of the feathers narrowly edged with white; two conspicuous wing bars; under parts, bright canary-yellow, tinged with olive on the sides; abdomen and crissum, pure white; lores and eye ring, yellow.

Young in first summer.—Smoky gray above, white below; chin and throat, pale yellow.

Nest pensile from a high branch similar to that of the Red-eye, but covered externally with lichens; eggs, three to four, white, spotted sparingly at the larger end with black and brown, .80 x .60.

Tolerably common summer resident. Arrives April 29th (May 3d), departs September 15th.

The Yellow-throated Vireo is a bird of the tree-tops, and hence is not so well known as the Red-eye, and may be more plentiful than we suppose. His notes are stronger and sweeter than those of the Red-eye, with a longer pause between, and there seems to be three slightly varying phrases repeated in the same order again and again, the first decidedly harsh: "See saw—I'm up here—You're down there."

629 **Lanivireo solitarius** (Wilson).

Blue-headed Vireo, Solitary Vireo.

Adults.—Length, 5–6. Wing, 3. Above, olive-green, mixed with slate-gray on the back; head, plain slate-gray; wings and tail, black, the feathers mostly edged with white or yellowish; two prominent wing bars; under parts, silky white, yellow-olive on the sides; eye ring and lores, white, with a dusky spot just before the eye, extending onto the eye ring.

Nest and eggs similar to those of the Red-eyed Vireo, .80 x .60.

Tolerably common transient visitant, no doubt breeding at High Knob, Sussex county, where Mr. Chapman found it in June, 1890.[1] Spring, April 20th to May 5th; autumn, September 20th to October 15th.

A tree Vireo of much the same habits and appearance as the Red-eye, but with some harsher notes in its warble. It is our earliest Vireo in springtime, and can always be identified by the blue-gray head and white eye ring.

631 Vireo griseus (Boddært).

White-eyed Vireo.

PLATE 70.

Adults.—Length, 4.50–5. Wing, 2.40. Above, dull olive-green, grayish on the neck; wings and tail, dusky, edged with olive or yellowish-white; two yellowish-white wing bars; under parts, white; sides of neck, grayish; sides of body and crissum, sulphur yellow; a tinge of the same color on the breast; lores and eye ring, pale yellow, interrupted by a dusky spot in front.

Young in first summer.—Dull brownish-olive above; below, white, tinged with buff on the breast and sulphur yellow on the flanks and crissum.

Nest pensile, swung from the fork of a low bush, and usually with much grass in its construction; eggs, three to four, white, with very small black spots on the larger end, .75 x .55.

Common summer resident. Arrives April 27th (May 3d), departs October 1st.

This is a characteristic bird of low swampy woods throughout the State, especially along the streams of south Jersey, in and out of the pine barrens. The habits of the White-eye are similar to those of other Vireos, with the exception that he confines himself to low bushes and never gets up into the trees.

His call is a loud warble resembling the syllables "wit-see-a-willie."

[1] Abst. Proc. Linn. Soc., N. Y., 1890-91, p. 4.

Family MNIOTILTIDÆ.

THE WOOD WARBLERS.

A large family of small, generally brightly colored birds, mostly arboreal, some terrestrial or living among the bushes. Almost entirely insectivorous, with slender sharp pointed bills. The songs of most of the species are weak and lisping, though some are much stronger and melodious.

These little birds form the bulk of the great night flights of the spring and fall migrations. A few are familiar summer residents, but the majority spend the breeding season in the depths of the northern woodland and forests. On their migration in May and September, however, they are always conspicuous, thronging the tree-tops as they search for food.

a. No yellow in the plumage.
b. Colors orange, black and white.
c. Throat black. REDSTART, p. 291
cc. Throat orange. BLACKBURNIAN WARBLER, p. 279
bb. Colors blue, black and white.
c. Throat black. BLACK-THROATED BLUE WARBLER, p. 274
cc. Throat white. CERULEAN WARBLER, p. 277
bbb. Under parts chestnut and white.
c. Throat chestnut. BAY-BREASTED WARBLER, p. 278
cc. Throat white. CHESTNUT-SIDED WARBLER, p. 277
bbbb. No orange, blue or chestnut in the plumage.
c. Streaked below, at least on the sides.
d. Streaked on the back.
e. Back black and white.
BLACK AND WHITE WARBLER, p. 266
ee. Back black and gray. BLACK-POLL WARBLER, p. 279
eee. Back olive with fine black streaks.
BLACK-POLL WARBLER (female), p. 279
f. Wing, 2.50.
BLACKBURNIAN WARBLER (young), p. 279
ff. Wing, 2.75.
BLACK-POLL WARBLER (young), p. 279
dd. Not streaked on the back.
e. Middle of crown dull buff, bordered by black.
OVENBIRD, p. 283
ee. Crown like the back, a light stripe over eye.
f. Throat speckled to the chin.
WATER THRUSH, p. 284
ff. Chin and upper throat not speckled.
LOUISIANA WATER THRUSH, p. 285

cc. Not streaked below.
d. Slightly streaked on back or rump; general color above yellow-olive.
e. Wing, 2.40–2.60.
CHESTNUT-SIDED WARBLER (young), p. 277
ee. Wing, 2.80–2.90.
BAY-BREASTED or BLACK-POLL WARBLER (young), p. 278
dd. Strongly streaked black and gray on back; cap, throat and flanks chestnut. BAY-BREASTED WARBLER, p. 278
ddd. Plain above.
e. Crown striped buff and black, back olive.
WORM-EATING WARBLER, p. 267
ee. Head uniform with the back.
f. Two rather dull wing bars.
g. Brown above.
PINE WARBLER (young), p. 280
gg. Blue-green above.
CERULEAN WARBLER (young), p. 277
ff. No wing bars.
g. A white spot at the base of the primaries.
BLACK-THROATED BLUE WARBLER (female), p. 274
gg. No white spot on the wings.
TENNESSEE WARBLER, p. 272

aa. Some yellow in the plumage.
b. Streaked below, at least on the sides.
c. General color of under parts black and white or brown and white.
d. Yellow restricted to the sides of the breast, rump and crown. MYRTLE WARBLER, p. 275
dd. Yellow restricted to sides of face and neck; throat black, back olive. BLACK-THROATED GREEN WARBLER, p. 280
cc. General color below buff and dull brown, yellow restricted to under tail-coverts and rump. PALM WARBLER, p. 281
ccc. Throat bright orange, breast white tinged with yellow.
BLACKBURNIAN WARBLER, p. 279
cccc. General color below yellow.
d. Streaks chestnut or rusty.
e. Crown yellow. YELLOW WARBLER, p. 274
ee. Crown chestnut. YELLOW PALM WARBLER, p. 282
dd. Streaks black or dusky and obscure.
e. Back not streaked or spotted.
f. Back black. MAGNOLIA WARBLER, p. 276
ff. Back blue gray. CANADA WARBLER, p. 291
fff. Back brown.
YELLOW PALM WARBLER (young), p. 282
ffff. Back olive.
g. Wing under 2.20.
PRAIRIE WARBLER (young), p. 282
gg. Wing over 2.75. PINE WARBLER, p. 280
ee. Back streaked or spotted.
f. Back olive, spotted with chestnut.
PRAIRIE WARBLER, p. 282

ff. Back olive, spotted with black.
g. Ear-coverts chestnut.
CAPE MAY WARBLER, p. 273
gg. Head olive, streaked with black.
BLACKBURNIAN WARBLER (young), p. 279
ggg. Head plain gray.
MAGNOLIA WARBLER (young), p. 276

bb. Not streaked below.
c. A chestnut and black spot on the breast.
PARULA WARBLER, p. 272
cc. Throat black.
d. Belly gray, yellow restricted to crown and wing-coverts.
GOLDEN-WINGED WARBLER, p. 269
dd. Belly yellow. HOODED WARBLER, p. 290
ccc. Throat gray or ashy, abdomen yellow.
d. A black patch on breast. MOURNING WARBLER, p. 287
dd. No black patch on breast.
e. A white eye ring. CONNECTICUT WARBLER, p. 287
ee. No eye ring. MOURNING WARBLER (female), p. 287
cccc. Throat white or gray, abdomen not yellow.
d. Yellow on crown and wing-coverts and rump only.
e. Sides of body chestnut.
CHESTNUT-SIDED WARBLER, p. 277
ee. Sides not chestnut. GOLDEN-WINGED WARBLER, p. 269
dd. Yellow on sides of chest, wings and tail only.
REDSTART (female), p. 291
ccccc. Throat yellow or olive-yellow.
d. Tail feathers partly yellow.
YELLOW WARBLER (young), p. 274
dd. Tail feathers partly white.
e. Back olive or slaty, head more or less yellow.
f. Whole head deep yellow.
PROTHONOTARY WARBLER, p. 267
ff. Fore part of crown yellow.
g. A black spot in front of the eye.
BLUE-WINGED WARBLER, p. 268
gg. No spot in front of the eye.
HOODED WARBLER, p. 290
ee. No yellow on crown.
f. Wings bluish-gray.
PARULA WARBLER (female and young), p. 272
ff. Wings olive.
TENNESSEE WARBLER (young and fem.), p. 272
fff. Wings dull brownish.
PINE WARBLER (female), p. 280
ddd. Tail with no white markings.
e. Wing, 3. CHAT, p. 289
ee. Wing, 2.60 or less.
f. Entire cheeks and frontlet black, or merely a dusky area below the eye (young).
g. Wing, 2.60. KENTUCKY WARBLER, p. 286
gg. Wing, 2.20.
MARYLAND YELLOW-THROAT, p. 288

ff. No black on cheeks or frontlet.
g. Crown more or less black, frontlet yellow.
WILSON'S WARBLER, p. 291
gg. Crown with a central chestnut or orange spot.
h. Spot chestnut.
NASHVILLE WARBLER, p. 270
hh. Spot orange.
ORANGE-CROWNED WARBLER, p. 271
ggg. Crown uniform with the back.
h. Lower abdomen white, much paler than the breast or under tail-coverts.
MARYLAND YELLOW-THROAT (female), p. 288
hh. Abdomen yellow, uniform with breast and under tail-coverts.
MOURNING WARBLER, p. 287

636 Mniotilta varia (Linnæus).

Black-and-White Warbler.

Adult male.—Length, 4.60–5.50. Wing, 2.75. Above, striped everywhere with black and white; sides and top of head, black, with a white stripe over each eye and down the middle of the crown; wings, black, edged with grayish-white; inner feathers broadly edged with pure white and coverts tipped with the same, forming two wing bars; tail, grayish-black; middle feathers, gray, with black along the shaft, two outer pairs with a terminal white spot on the inner vane; body below everywhere striped with black and white, except the center of the breast, which is white. In autumn the throat is nearly pure white.

Adult female.—Similar, but the white above tinged with buff; stripes on the under side restricted to the sides of the body and more or less indistinct; sides washed with buff.

Young in first summer.—Dark brown above, streaked with a lighter shade; head streaks, dull white; below, dull white, washed with brown on throat and sides and obscurely streaked.

Young in first autumn.—Similar to autumnal adult, but streaks below much narrower and restricted to the sides of the body.

Nest of grass, bark, etc., on the ground under the shelter of a log; eggs, four to five, white, spotted with brown about the larger end, .65 x .50.

Common summer resident in the northern counties; less abundant breeder in the southern part of the State. Arrives April 18th (April 26th), departs October 5th.

The Black-and-White Warbler is a "tree-creeper" of no mean ability, and in the migrations we see him constantly circling the trunks in a way that would do credit to a Creeper or Nuthatch. His song is a

squeaking see-saw, "ki-tseé, ki-tseé, ki-tseé, see, see," accented on the last syllable of each couplet.

This species nests rather sparingly both within and without the pine barrens in south Jersey and rather more plentifully northward.

637 Protonotaria citrea (Boddært).

Prothonotary Warbler.

Adults.—Length, 5.25. Wing, 2.90–3. Back of head to middle of back, yellow-olive; lower back, rump, wings and tail, blue-gray; head, crown and under parts to flanks, bright canary-yellow; under tail-coverts, white, and white marks on inner webs of all but the central tail feathers.

The Prothonotary Warbler's claim to a place in the New Jersey list rests upon a specimen obtained at Princeton by Professor A. H. Phillips, May 8th, 1894,[1] and an individual seen at Haddonfield, early in the eighties, by Mr. S. N. Rhoads.[2]

639 Helmitheros vermivorus (Gmelin).

Worm-eating Warbler.

Adults.—Length, 5.50. Wing, 2.75. Above, grayish olive-green; crown and sides of head, buff; a broad black stripe down each side of the crown and a narrow one behind the eye; under parts, buff, becoming whitish on the abdomen; crissum mottled with olive.

Young in first summer.—Everywhere cinnamon, darker above; wing and tail, olive, head markings indistinctly indicated.

Nest on the ground of leaves and grass, lined with moss stems; eggs, four to five, white, speckled with reddish-brown, .70 x .52.

Local and rather uncommon summer resident in the middle counties and Hudson Valley.[3] Not found in the pine barrens, and very rare on the Delaware, south of Trenton. Arrives April 29th (May 9th), departs September 1st.

This is a rather common bird in wooded ravines in southeastern Pennsylvania, but is rarer in New Jersey and unknown as a breeder in the southern half of the State.

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[1] Babson, Birds of Princeton, p. 71.

[2] Stone, Birds of E. Pa. and N. J., p. 129.

[3] Chapman, Abst. Proc. Linn. Soc., N. Y., V., p. 8, and Birds vicinity N. Y., p. 177, also Rhoads, Cassinia, 1901, p. 50.

Mr. Miller finds it locally common at Plainfield. Mr. Babson thinks it breeds rarely at Princeton,[1] and Mr. Hann found one nest at Chatham, and Mr. Holmes[2] regards it as rare at Summit. Mr. Thurber found it rare at Morristown. Mr. S. N. Rhoads found it breeding at Greenwood and Echo Lakes, Passaic county, June, 1909.

The only record of its nesting in west Jersey, south of Trenton, is a female, apparently with young, observed by Mr. S. N. Rhoads, near Camden, in July, 1880.[3]

641 Vermivora pinus (Linnæus).

Blue-winged Warbler.

Adult male.—Length, 4.80. Wing, 2.40. Above, yellowish olive-green, brighter on rump and bright yellow on the crown; wings and tail, bluish-gray; two white wing bars and three outer tail feathers largely white on the inner webs; under surface, bright yellow; a jet black line through the eye.

Adult female.—Similar, but duller, and yellow not so pure.

Young in first summer.—Similar to adult female.

Nest on the ground in low woods, composed of leaves and shreds of bark; eggs, four to six, white, with small scattered spots of reddish-brown, .65 x .50.

Common summer resident in the middle and northeastern counties, rare on the northern edge of the pine barrens and absent in the northwestern counties and in the pine barrens and apparently also in southwest Jersey. Mr. J. Fletcher Street has found it along the Rancocas in the breeding season, and Mr. R. C. Harlow found it at Clementon, June 9th, 1906, and June 6th, 1907, also at Bennett, in lower Cape May county, May 24th, 1907, and June 3d, 1908. Mr. S. N. Rhoads, in a long experience, never saw it at Haddonfield. Arrives May 1st (May 6th), departs September 1st.

Common breeder in the lower Hudson Valley (Chapman), Demarest (Bowdish), Montclair, Summit and Chatham (Hann and Callender), Plainfield (Miller); rare breeder at Paterson (J. H. Clark) and Morristown (Thurber) and on Mt. Lucas only, in the Princeton region (Babson). Mr. Rhoads saw four at Greenwood Lake, June, 1909.

This species is found near the ground in low woods and on the edge of swampy thickets. Its note is an insect-like "s-e-e-e, z-e-e-e-e."

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[1] Birds of Princeton.

[2] Wilson, Bull., 1905, p. 11.

[3] Bull. Nutt. Orn. Club, 1882, p. 55.

642 Vermivora chrysoptera (Linnæus).

Golden-winged Warbler.

Adult male.—Length, 5.10. Wing, 2.45. Above, bluish-gray; crown, yellow; wing-coverts tipped with yellow forming two bands; three outer tail feathers with large white spots on the inner web, the outermost more than half white; throat, black; rest of under parts, white, washed with gray on the sides; sides of face, black, with a broad white stripe separating this from the black on the throat, and a short white line over the eye. In autumn the black throat is usually veiled with short white tips to the feathers.

Adult female.—Tinged with green above, and black areas replaced by dark gray.

Young in first summer.—Above, olive-gray; below, pale olive-yellow; throat, dusky.

Nest on the ground, built of leaves and grass; eggs, four to six, white, speckled on the larger end with reddish-brown, .62 x .50.

Rather rare transient visitant, spring, May 12th to 16th; autumn, August 15th to September 5th, and rare summer resident in the northern counties.

The Golden-wing is a close ally of the Blue-winged Warbler which it resembles in habits. Mr. Thurber calls it a rare summer resident at Morristown, and Mr. P. B. Philipp has found it nesting at Newton, Sussex county. Dr. Dwight and Mr. Rhoads found it at Lake Hopatcong in summer and regard it as a breeder there, and in June, 1909, Mr. Rhoads found it at various points in northern Passaic and Sussex counties.

This species and the Blue-winged Warbler are supposed to hybridize, as only in this way can we account for the curious birds known as Brewster's and Lawrence's Warblers which are intermediate between them.

Vermivora leucobronchialis (Brewster).

Brewster's Warbler.

Vermivora leucobronchialis (Brewster).

Lawrence's Warbler.

These birds are now generally recognized as hybrids, between the Blue-winged and Golden-winged Warblers. Brewster's Warbler is essentially a Golden-wing without the black throat, while Lawrence's Warbler is a Blue-wing with a black throat, but various intermediate forms have also been obtained.

The following have been secured in New Jersey:

Morristown; Aug. Blanchet; May 1859;[1] *leucobronchialis.*

Chatham; Aug. Blanchet; May, 1874;[2] *lawrencei* (type).

Maplewood; C. B. Riker; May 11th, 1883;[3] *leucobronchialis* x *pinus.*

Hoboken; D. B. Dickinson; September, 1876;[4] *lawrencei.*

Morristown; Frank Blanchet; May 15th, 1884;[5] *lawrencei* x *pinus.*

Englewood; F. M. Chapman; May 15th, 1886;[6] *leucobronchialis.*

Englewood; F. M. Chapman; June 26th, 1887;[6] *leucobronchialis.*

Englewood; F. M. Chapman; July 31st, 1887;[6] *leucobronchialis.*

Morristown; E. C. Thurber; May 15th, 1887;[7] *leucobronchialis.*

Geo. E. Hix[8] saw a typical *leucobronchialis* at Englewood, May 13th, 1905, while Mr. Chapman heard a male *leucobronchialis* in full song at Englewood, May 11th, 1890,[9] and in 1892 found a pair of birds breeding, one *leucobronchialis,* the other *pinus.*[10]

645 Vermivora rubricapilla (Wilson).

Nashville Warbler.

Adult male.—Length, 4.75. Wing, 2.30. Above, gray on head and neck; center of crown, chestnut; rest of the upper parts, olive-green, no wing bands or tail marks; under parts, plain yellow, tinged with olive on the sides. In autumn the chestnut patch is more or less obscured.

Adult female.—Similar, but chestnut patch obscure or lacking.

Young in first summer.—Brownish above, olive on the rump; below, yellowish-brown, brighter yellow on the abdomen.

Nest on the ground, composed of moss, grass and fine rootlets; eggs, four to five, white, speckled with brown at the larger end, .60 x .45.

Tolerably common transient visitant. Spring, May 6th to 14th; autumn, September 1st to October 1st. Rare summer resident in the northern part of the State.

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[1] Thurber, Auk, 1886, p. 411.
[2] Herrick, Proc. Acad. Nat. Sci., Phila., 1874, p. 320.
[3] Auk, 1885, p. 378.
[4] Herrick, Bull. Nutt. Orn. Club, 1877, p. 19.
[5] Brewster, Auk, 1886, p. 411.
[6] Auk, 1887, p. 348.
[7] Auk, 1887, p. 349.
[8] Auk, 1905, p. 417.
[9] Auk, 1890, p. 291.
[10] Auk, 1892, p. 302.

The Nashville is a rather inconspicuous Warbler, difficult to identify in the tops of the young trees, where it is usually found, along the edge of old clearings. Its song, however, is peculiar, and is represented by Mr. Langille as "ke-tsee, ke-tsee, ke-tsee; chip-ee-chip-ee-chip-ee-chip," the latter half being much like the trill of the Chipping Sparrow.

Mr. Chapman took a breeding female at Englewood, June 16th, 1887,[1] which is our only evidence of its nesting in the State.

646 Vermivora celata (Say).

Orange-crowned Warbler.

Adults.—Length, 4.75–5.25. Wing, 2.40. Above, olive, brightest on the rump, crown with a patch of tawny ochraceous often obscured by grayish tips; under parts, pale olive-yellowish, very faintly streaked on the sides with dusky, a faint pale line over the eye.

Young in first autumn has the crown patch less distinct.

Very rare transient visitant. February, March and October, possibly winter resident in the southernmost counties.

The only New Jersey records appear to be as follows:

Rancocas Creek; early in February, 1860. Turnbull.

Hoboken; May, 1865. C. S. Gallraith (Coll. Amer. Mus. Natural History).[2]

Haddonfield; March 22d, 1883. S. N. Rhoads (Coll. W. Stone).[3]

Anglesea; October 6th, 1889. P. Laurent (Coll. P. L.).[4]

Haddonfield; February 25th, 1909. R. T. Moore (Coll. R. T. M.).

Thurber also mentions it as a very rare transient at Morristown, and John Krider states that he got one in New Jersey in December, when the ground was covered with snow.

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[1] Auk, 1889, p. 304.
[2] Howell, Auk, 1893, p. 90.
[3] Bull. Nutt. Orn. Club, 1883, p. 179.
[4] O. and O., 1892.

647 Vermivora peregrina (Wilson).

Tennessee Warbler.

Adult male.—Length, 5. Wing, 2.60. Above, plain olive-green, with top of head gray; a whitish line over the eye and a dusky streak through it; lower parts, white, tinged with buff on the sides; no wing bars or tail markings.

Adult female.—Similar, but with the gray cap obscured by olive.

Young in first autumn.—Similar, but more buffy below and gray cap scarcely distinguishable.

Rare transient visitant, more common in autumn. Spring, May 15th to 25th; autumn, August 25th to October 1st (Babson).

One of the least distinctive of our migrant Warblers, closely resembling the Nashville in habits. Very rare in spring.

648a Compsothlypis americana usneæ Brewster.

Northern Parula Warbler.

Adult male.—Length, 4.25–4.75. Wing, 2.30. Above, grayish-blue, with a yellow-olive triangular patch on the back; coverts broadly tipped with white forming two bars; three outer tail feathers with subterminal white spots on the inner webs, the outermost the largest; under side of body, yellow on throat and chest, a pectoral band of chestnut with a darker spot in the center; abdomen and sides, white, the latter streaked with chestnut; a white spot on the lower eyelid and a blackish spot in front of the eye. In autumn the colors are veiled with olive above and yellow below, so that the markings are somewhat obscured.

Adult female.—Always duller than the male, with chestnut breast markings often lacking.

Young in first summer.—Gray, lighter beneath, and tinged with olive above; throat, yellowish.

Nest in tufts of Usnea moss, made wholly of the moss itself; eggs, four to five, white, with fine rufous spots at the larger end, .64 x .44.

Common summer resident in the pine barrens and casually so elsewhere, though mainly a transient in other parts of the State.

Arrives April 28th (May 4th), departs October 1st.

The pine barren swamps, where all the bushes and dead trees are festooned with the long, gray "old man's beard" or Usnea moss, are the home of the Parula, and from every side one can hear the fine lisping song, "pe-tsee, pe-tsee, pe-tsee-see," as Professor Jones writes it.

The birds are governed, in their distribution, by the abundance of

the moss, and as it is rare and local outside of the pine barrens, they are seldom found breeding out of this district.

Mr. P. B. Philipp found them nesting regularly, but not commonly, at Newton, Sussex county, in June, 1906 and 1908, and Mr. F. M. Chapman saw one at High Knob, in the same county, June 10th, 1890.

In migration the Parula associates with the mixed Warbler throng and exhibits no peculiarities of habit.[1]

650 Dendroica tigrina (Gmelin).

Cape May Warbler.

Adult male.—Length, 4.75–5.50. Wing, 2.85. Above, olive-green, shaded with gray; top of head, black; lower rump, yellowish; back obscurely spotted with black; wings and tail, dusky; a broad white wing bar and white subterminal spots on the three outer pairs of tail feathers; sides of face, bright chestnut; line over the eye, yellow, largely suffused with chestnut, and a yellow patch on the side of the neck below the chestnut; under parts, pale yellow, becoming white on the middle of the abdomen and under tail-coverts; throat, breast and sides heavily streaked with black, the first sometimes washed with chestnut. In autumn, much veiled with grayish edgings to the feathers.

Adult female.—Much paler; head, olive, spotted with dusky; a faint yellow streak over the eye, a pale yellow one on each side of the neck; under surface, white, in older birds more or less tinged with yellow and streaked with gray on the throat, breast and sides; sides of face, gray.

Young in first autumn.—Similar to adult female.

Very rare transient visitant.

Mr. Babson, in his Birds of Princeton, states that W. E. D. Scott secured several specimens in the autumn. Thurber records one taken at Chatham, Morris county, by Maj. Blanchet. Mr. Chapman obtained one at Englewood, and Krider states that he has taken it in New Jersey, but so far as I am aware no others have been recorded from the State since the male described by Alex. Wilson, which was obtained by George Ord, in 1809, near Cape May, to which capture the bird owes its name, and a female obtained by Chas. L. Bonaparte, at Bordentown, May 14th, about 1825. Recently Mr. Robt. T. Moore obtained two at Haddonfield, September 22d, 1897, and October 2d, 1906; while Mr. S. N. Rhoads saw a male in full song at the same place, May 15th, 1909.

The chestnut ear patch is an excellent "ear mark" for identification.

[1] *Cf.* Wilde, Auk, 1897, p. 289, and Wilson, Bull., XVII., p. 4, for good accounts of its nesting in New Jersey.

652 Dendroica æstiva (Gmelin).

Yellow Warbler.

PLATE 71.

Adult male.—Length, 4.50–5.25. Wing, 2.50. Above, yellow-olive; bright yellow on the crown; wings and tail, dusky, edged with yellow; tips of the coverts forming two fairly distinct bands; inner webs of all but the central pair of tail feathers more or less yellow; sides of face and whole lower surface, rich golden yellow, the breast and sides streaked with chestnut. In autumn greener above, and streaks somewhat veiled by yellow tips.

Adult female.—Similar, but duller and greener, with streaks fewer and narrower.

Young in first autumn.—Male similar to adult female; female still duller, with no streaks below and throat whitish.

Young in first summer.—Above, pale olive-brown; below, sulphur yellow, without streaks.

Nest of soft vegetable fibers and vegetable down in a bush near water; eggs, four to five, bluish-white, with a wreath of brown spots at the larger end, .65 x .50.

Common summer resident though somewhat local. Arrives April 24th (April 30th), departs September 25th.

This is our best-known breeding warbler. In southern Jersey it is always found near the water, nesting plentiful in the swampy thickets along the Delaware and its tributaries, but in the pine barren swamps I have never detected it.

In the northern counties it is said to be more a bird of the garden and orchard, breeding in the shrubbery near houses.

Its nest is a favorite repository for the Cowbird, and the Warbler has been known to raise the sides in order to bury the intruder's egg in the bottom, depositing its own eggs on the upper floor.

The song of the Yellow Warbler is a liquid "sweet-sweet-sweet-sweeter-sweeter."

654 Dendroica cærulescens (Gmelin).

Black-throated Blue Warbler.

Adult male.—Length, 4.75–5.50. Wing, 2.60. Above, uniform grayish-blue, a square white patch covering the bases of the primary wing feathers, conspicuous even when the wings are closed; two outer tail feathers with white subterminal areas, the third often edged with white near the tip; under parts, white, with the throat, sides of head and sides of breast black. In autumn the throat feathers are frosted with white and there is often an olive tinge to the upper parts.

Adult female.—Uniform olivè above, pale olive-yellow below; wing edgings tinged with gray; the white wing spot is less conspicuous than in the male; there is a white spot on the lower eyelid and a short streak above the eye; the outermost tail feather has a lighter subterminal area often scarcely distinguishable. In autumn, deeper olive.

Young in first summer.—Olive-brown above, brownish-white below, yellowish on the throat.

Common transient visitant. Spring, April 27th (May 4th) to May 20th; autumn, August 25th to October 10th. Probably rare breeder in Sussex county where Mr. S. N. Rhoads saw one June 5th, 1909, at Wawayanda Lake.

This is one of the species composing the regular Warbler waves of May, which mark the height of spring migration. These assemblages, which seem to contain all the known varieties of Warblers, so thickly do they swarm in the tree-tops—now one kind, now another—coming within the range of our glass, are characteristic of most of the State, but they seem to avoid the dry pine barrens, the lower trees and drier soil, and prevalence of pines being apparently not to their liking.

The Black-throated Blue Warbler, both the male and female, may be easily recognized by the white spot on the middle of the wing at the base of the primaries, a mark not common to any other species.

The song of this species has a peculiar harsh or buzzing quality, "wee, zwee, zwe-e-e-."

655 Dendroica coronata (Linnæus).

Myrtle Warbler, Yellow-rumped Warbler.

PLATE 72.

Adult male.—Length, 5–6. Wing, 2.80. Above, bluish-gray, with black streaks broadest on the back; a yellow patch on the crown and rump; wings and tail, blackish, edged with gray; wing-coverts broadly tipped with white, forming two conspicuous bars; three outer tail feathers with subterminal white patches on the inner webs; under surface, white, with a large black breast patch extending down the sides of the chest, where it is bordered just under the edge of the wings with yellow; flanks streaked with black; sides of face, black, with a short white streak over the eye and a white spot on the lower lid. In winter, veiled above and below with olive and gray.

Adult female.—Rather smaller. More or less brown above; sides of face, brown; black on breast not so extensive and broken by white edgings to the feathers, yellow much paler.

Young in first autumn.—Similar to adult female, but browner, with streaking of upper parts obscured; breast and sides tinged with brown and thickly streaked with black, streaks more or less obscured by the light edges to the feathers.

Common transient visitant and common winter visitant especially near the coast. Spring, March 29th (April 24th) to May 20th; autumn, September 25th to November 1st.

In the bayberry thickets and cedars along the coast of New Jersey and northward as far as Englewood, the Myrtle Warblers may be seen in flocks all winter long, the wax-covered berries of the bayberry (Wax Myrtle) affording them their principal food at this season.

In the interior of the State they also occur casually in winter—

Summit (Hann), Plainfield (Miller), Crosswicks (C. C. Abbott), Burlington (Miss Minnie V. Flynn), Haddonfield (S. N. Rhoads).

In the early spring they start northward, and are usually among the earlier Warblers of the spring migration.

The Myrtle Warbler is rather deliberate in its actions, hopping from limb to limb, with wings drooping so that the yellow rump-patch is conspicuously displayed. Its winter note is a characteristic chipp; its song a trill or twitter.

This is the only member of the Warbler family to winter regularly in the State.

657 Dendroica magnolia (Wilson).

Magnolia Warbler.

Adult male.—Length, 4.50–5. Wing, 2.35. Above, black; top of head, except the forehead, gray; rump, yellow; wing-coverts largely white, forming a large conspicuous patch, the usual double bars running together; the middle portion of all but the central pair of tail feathers white on the inner web for the same distance on each feather, making a conspicuous broad band across the tail when expanded; sides of face, black, with a white line over the eye; under parts, bright yellow, heavily streaked with black on the chest and sides, streaks often confluent on the middle of the chest; under tail-coverts, white. *In autumn*, top and sides of head and hind neck uniform gray; back, olive-green, with black centers to the feathers; rump, yellow; upper tail-coverts, black; two narrow white bars on the wings; under parts with black streaks obscured by yellow tips and largely restricted to the sides.

Adult female.—Similar to male, but gray extending back over the hind neck and back streaked with olive; stripes below narrower.

Young in first autumn.—Like autumnal male, but duller, with streaks above and below obscure, and throat washed with ashy.

Common transient visitant. Spring, May 7th to 12th; autumn, August 20th to October 5th.

The Magnolia Warbler is always recognized by the white band across the middle of the tail.

Its note, as described by Mr. J. H. Langille, is "chee-to, chee-to, chee-tee-ee," a clear rapid whistle ending in a falling inflection.

658 Dendroica cærulea (Wilson).

Cerulean Warbler.

Adult male.—Length, 4–5. Wing, 2.50. Above, grayish cerulean blue, back streaked with black and rump feathers with black bases, wings with two white bars, tail with white subterminal spots on all but the center pair of feathers; ear-coverts, grayish; under parts, white, streaked on the sides with black, strongly tinged with grayish-blue; a band of the same color across the chest.

Adult female.—Grayish olive-green above, brighter, often bluish, on the head, no streaks; under parts, white, tinged with pale yellow, and a superciliary stripe of the same.

Young in first autumn.—Similar to adult female, but more streaked on the sides.

Very rare straggler during migration.

The only New Jersey records of the Cerulean Warbler are one killed by Dr. C. C. Abbott, near Trenton,[1] and one secured at Boonton, Morris county, September 1st, 1887, by S. D. Judd.[2]

659 Dendroica pensylvanica (Linnæus).

Chestnut-sided Warbler.

Adult male.—Length, 4.75–5.25. Wing, 2.50. Above, heavily streaked with black on a whitish or olive ground; whole top of head, yellow; two pale yellowish bands on the wings, three outer tail feathers largely white on the inner webs; sides of face, black; ear-coverts and sides of neck, white; under parts, pure white, a rich chestnut stripe running from the black at the base of the bill to the flanks. In autumn entirely different, bright yellow-olive above with concealed black centers to the feathers of the back; below, pure white, except a wash of chestnut on the flanks.

Adult female.—Similar to male, but duller; crown, greenish and chestnut, stripes not so extensive.

Young in first autumn.—Duller than the adult male in autumn, no stripes above and no chestnut on the flanks.

Nest in low bushes, similar to that of the Yellow Warbler; eggs, four to five, white, speckled with brown or gray, .65 x .50.

Common transient visitant in the southern half of the State, and summer resident in the northern counties. Spring, May 5th to 15th; autumn, August 15th to September 25th.

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[1] Birds of New Jersey, 1868.

[2] Auk, 1897, p. 326.

Nests from Plainfield (Miller) to Demarest (Bowdish), and Alpine (Rhoads), and at Summit (Hann), Lake Hopatcong (Dwight) and High Knob, Sussex county (Chapman), Sussex and Passaic counties generally (Rhoads).

It has also been seen in June on Mt. Lucas, near Princeton, where it no doubt breeds sparingly, but this is the most southern station (Babson).

The Chestnut-sided Warbler in migration associates with the various other species that make up the great warbler waves, and exhibits no peculiarities in habits or haunts.

In its summer home it is a bird of open clearings covered with low second growth.

Its song closely resembles that of the Yellow Warbler and may be represented by the syllables "tsee, tsee, tsee, tsee,—wee tsee."

660 **Dendroica castanea** (Wilson).

Bay-breasted Warbler.

Adult male.—Length, 5–6. Wing, 2.80. Above, gray, somewhat tinged with buff and broadly streaked with black, except on the rump; top of head, chestnut; forehead and sides of head, black; sides of neck, buff; two broad wing bars, two outer tail feathers with white subterminal spots; under surface of body, chestnut, except the center of the abdomen and under tail-coverts, which are buffy-white. In autumn yellowish-olive above streaked with black on the head and back; below, pale buff, white in the middle of abdomen and a strong wash of chestnut on the flanks; upper and lower eyelids, white.

Adult female.—Similar to the male, but much smaller, with chestnut area much reduced.

Young in first autumn.—Similar to autumnal adult, but chestnut on the flanks a mere trace.

Usually a rather rare transient visitant, but common in some seasons, and always more plentiful in autumn. Spring, May 10th to 20th: autumn, August 20th to October 1st.

The Bay-breast is always more abundant in autumn, at which time it is very hard to distinguish it from the Black-poll.

Like most migrant warblers it is rare in the pine barrens.

661 Dendroica striata (Forster).

Black-poll Warbler.

Adult male.—Length, 5.50. Wing, 2.80. Above, gray, streaked with black; gray replaced by white on the hind neck; whole top of head, black; wing-coverts broadly tipped with white, forming two bars; sides of face, white; under parts, white, streaked with black from the chin down the sides of the throat to the flanks; two outer tail feathers with subterminal white spots. In autumn olive-green above, streaked with black on the back; below, pale yellowish, with dusky stripes on the sides and flanks; upper and lower eyelids, white.

Adult female.—Above, olive-green; head, neck and back distinctly streaked with black; below, white, tinged with yellow and finely streaked with black on the sides of the throat and body. Resembles the male in autumn, but more streaked above.

Young in first autumn.—Similar to autumnal adult, but less streaked, nearly uniform below.

Abundant transient visitant. Spring, May 10th to June 1st; autumn, September 10th to October 15th. In the exceptionally late season of 1907 it was seen at Moorestown until June 17th.

The Black-poll is a late migrant, bringing up the rear of the spring procession, and appears to outnumber any of the other species.

His note is a delicate insect-like "tsee, tsee, tsee, tsee, tsee, tsee," all in one pitch.

662 Dendroica fusca (Müller).

Blackburnian Warbler.

Adult male.—Length, 4.50–5.50. Wing, 2.75. Above, black, streaked with white on the back and neck; crown with a median stripe of orange; wings with the lesser-coverts broadly tipped with white and the greater-coverts largely white, forming together a large white area; three outer tail feathers largely white on the inner web, the fourth with a white spot; under parts brilliant orange from the chin to the chest, including the sides of the head, except the ear-coverts, which are black; abdomen, white; a row of black streaks from the neck to the flanks on each side. In autumn quite different, olive-gray above streaked with black, streaks coarse on the back; two distinct white bars on the wings; under surface, pale yellow, tinged with orange on the throat and breast; abdomen, yellowish-white; sides streaked with black.

Adult female.—Similar to male, but much duller, gray above instead of black in spring, and head streaked with black, browner above in autumn.

Young in first autumn.—Like autumnal adult female, young females still duller, obscurely streaked above and with only a wash of yellow on the breast below.

Tolerably common transient visitant. Spring, May 4th to 15th; autumn, August 25th to October 15th.

667 Dendroica virens (Gmelin).

Black-throated Green Warbler.

Adult male.—Length, 4.50–5.25. Wing, 2.50. Above, yellowish olive-green, some of the feathers of the back centered with black; wing-coverts broadly tipped with white, forming two bands; three outer tail feathers with large white areas on the inner webs; forehead, cheeks and sides of neck, and broad line over the eye, bright yellow; throat, breast and sides of body, black; middle of abdomen and under tail-coverts, white, slightly tinged with pale yellow. In autumn the black is veiled with yellow tips to the feathers.

Adult female.—Similar, but duller, and with less black; chin and upper throat usually yellowish-white.

Young in first autumn.—Similar to adults, but with much less black and with long yellowish tips to the feathers. In the female there is no black on the breast and only black streaks on the sides.

Nest in trees or sometimes near the ground; eggs, three to four, white, with a wreath of brown and lilac spots, .60 x .50.

Common transient visitant. Spring, April 28th (May 3d) to May 15th; autumn, September 1st to October 10th.

Only one nest of this species has been found in the State. It was discovered by Mr. B. S. Bowdish, at Demarest, June 5th, 1904.[1] That it may prove a regular summer resident, in the same region, is suggested by the fact that Messrs. S. N. Rhoads and Wm. B. Evans found it at Alpine, on the palisades, in June, 1901,[2] and in June, 1909, Mr. Rhoads found them evidently breeding at Greenwood, Wawayanda and Echo Lakes.

An easily recognized member of the spring Warbler host, with a most distinctive song, "pee, tee, chee-o, tee," as given by Professor Jones, the third and fourth notes joined together and representing a drop from the former pitch, to which it returns on the last note; the first, second and fifth are short or staccato.

671 Dendroica vigorsi (Audubon).

Pine Warbler.

Adult male.—Length, 5–5.50. Wing, 2.75–3. Above, olive-green; wings and tail, dusky, the former with two whitish wing bars, the latter with large white areas on the inner webs of the two outer pairs of feathers; below, yellow, with indistinct dusky streaks on the sides of the breast; middle of abdomen and under tail-coverts, white; a faint line of yellow just above and below the eye. In autumn the colors are softer and more blended.

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[1] Auk, 1906, p. 17.

[2] Cassinia, 1901, p. 50.

Adult female.—Much browner above and paler beneath, often without a trace of yellow.

Young in first summer.—Brown above, drab beneath, somewhat mottled with dark gray; center of abdomen, whitish; wing and tail feathers as in the adult.

Nest of strips of bark, leaves, etc., in a pine tree, twenty or thirty feet up; eggs, four to five, grayish-white, with a ring of brown spots at the larger end, .68 x .52.

Common summer resident in the pine barrens; elsewhere a rare transient. Arrives March 30th, departs October 5th.

The Pine Warbler is one of the most characteristic birds of the pine barrens of the southern part of the State. It is deliberate in its movements, slowly exploring the thick bunches of pine needles or occasionally clinging to the trunk of the tree in pursuit of insects.

In plumage it is one of the plainest of our Warblers. Its song is a clear trill, closely resembling that of the Chipping Sparrow.

While undoubtedly nesting abundantly all through the pines, the nest is exceedingly hard to find, and, so far as I am aware, the only ones found recently were one discovered by Mr. R. T. Moore, near Tuckahoe,[1] May 13th, 1908, and two found by Mr. H. H. Hann, at Chatsworth, May 28th and June 1st, 1904.[1]

At High Knob, Sussex county, Mr. F. M. Chapman found a colony of these birds, June 10th, 1890, and secured a young one, which is the only evidence of their nesting outside of the barrens. At Englewood he had seen it but twice.[2]

Mr. S. N. Rhoads saw one at Haddonfield, on January 30th, 1898, and possibly a few may winter regularly among the pines.[3]

672 Dendroica palmarum (Gmelin).

Palm Warbler.

Similar to the next in general appearance but much paler, with yellow largely replaced by white and size smaller. Length, 4.50–5.50. Wing, 2.50.

Rare transient visitant; the bulk of the migration taking place west of the Alleghanies.

One was taken at Princeton, October, 1877, by Mr. W. E. D. Scott;[4]

[1] Cassinia, 1908, p. 29.
[2] Auk, 1889.
[3] Abst. Proc. D. V. O. C., III., p. 2.
[4] Babson, Birds of Princeton, p. 74.

another was obtained by Mr. H. C. Oberholser,[1] at Red Bank, Monmouth county, September 28th, 1889; still another I secured at Cape May, September 11th, 1893, while Mr. W. D. W. Miller[2] found them rather common near Plainfield, September 23d to October 4th, 1903.

672a Dendroica palmarum hypochrysea Ridgway.

Yellow Palm Warbler, Yellow Red-poll Warbler.

Adults in spring.—Length, 5–5.75. Wing, 2.75. Above, olive-brown, passing into olive-yellow on the rump; back and nape distinctly streaked with dusky; wing and tail, dusky, the latter with white areas at the tips of the inner webs of the two outer pairs of feathers; top of head, bright chestnut, with a yellow line over the eye; under parts, canary-yellow; ear-coverts, sides of throat and chest streaked with chestnut.

Adults in autumn.—Much duller, more olive below; chestnut crown much more veiled with olive or only present in a few spots; streaks everywhere indistinct and veiled.

Common transient visitant. Spring, April 10th (April 17th) to April 25th; autumn, October 10th to 20th. Mr. S. N. Rhoads took a specimen at Mays Landing, December 2d, 1892.[3]

This warbler has many peculiarities; it arrives early in the spring before the great warbler flights, and is a bird of the ground or low bushes; its most characteristic habit, however, is the regular wagging of the tail after the manner of the Titlark or Water Thrush.

673 Dendroica discolor (Vieillot).

Prairie Warbler.

PLATE 71.

Adult male.—Length, 4.25–5. Wing, 2.25. Above, olive-green, mottled with bright chestnut across the back; wings and tail, dusky; lesser wing-coverts broadly tipped with yellow, forming a prominent band; greater-coverts slightly edged with white; four outer tail feathers more or less white, the outermost mainly white even on the base of the outer web, decreasing to an oval spot on the fourth feather; below, bright yellow, heavily streaked with black on the sides of the breast and abdomen; a yellow line from the bill over the eye, a

[1] Auk, 1895, p. 185.
[2] Bird Lore, 1903, p. 199.
[3] Stone, Birds of E. Pa. and N. J., p. 137.

black line through the eye, a yellow streak below it and a black line separating this from the throat, also a triangle of black on each side of the neck. In autumn similar, but with the black streaks veiled with yellow and in first-year birds the markings less extensive.

Adult female.—Similar, but much duller, with narrower black streaks and less chestnut on the back, sometimes scarcely a trace.

Young in first summer.—Above, brownish-olive; below, brownish on the breast and throat, whitish on the abdomen; wings and tail similar to adult.

Nest of fine fibers and downy substances, placed in a low bush; eggs, four to five, white, with a circle of brown spots at the larger end, .64 x .48.

Common summer resident in the pine barrens; rather scarce migrant elsewhere. Arrives May 1st, departs September 15th. Mr. Chapman never saw it at Englewood[1] and Mr. Holmes had but one record at Summit.

The Prairie Warbler is another of the birds that make the pine barrens interesting territory for the ornithologist. In and out among the scrubby oak and pine bushes he is continually alert and even in the boiling sun of midday the air is filled with the drowsy monotonous "zee, zee, zee, zee, zee-zee," hardly louder than the shrilling of a cricket.

The nest in this region is often placed in a holly bush, well concealed by the prickly leaves.

674 Seiurus aurocapillus (Linnæus).

Ovenbird, Golden-crowned Thrush.

PLATE 73.

Adults.—Length, 5.50–6.50. Wing, 2.80. Above, dull olive-green, two black stripes from the base of the bill to the hind neck, inclosing a patch of tawny buff; below, white, streaked heavily with black across the breast and down the sides, with a black line from the bill down the side of the throat.

Young in first summer.—Above, cinnamon-brown, streaked with blackish on the back and two faint black stripes on the head; wings and tail, olive, wing-coverts tipped with cinnamon; below, pale cinnamon on the throat and breast, mottled with dusky spots; rest of under surface, white.

Nest on the ground, arched over above, built of leaves, grass and slender rootlets; eggs, four to five, white, speckled with reddish-brown, .80 x .60.

Common summer resident. Arrives April 26th (April 30th), departs October 9th.

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[1] Auk, 1889, p. 198.

The Ovenbird is one of the most characteristic birds of our woodlands, and in spring and early summer they fairly ring with its music.

The usual song is the familiar "cher, téa-cher, téa-cher, téa-cher, téa-cher," beginning rather low and becoming louder with repetition.

The bird has, however, a much more elaborate flight song at the height of the breeding season.

The Ovenbird is distinctly a ground warbler and walks deliberately about over the dead leaves, flying up to some low branch when disturbed or when about to sing.

This is one of the birds that habitually tries to lure you from its nest by feigning lameness or a broken wing, and flutters along ahead of the intruder as if scarcely able to get out of the way. Full activity, however, is soon regained when it has led you safely away from the nest.

675 Seiurus noveboracensis (Gmelin).

Water-Thrush.

PLATE 73.

Adults.—Length, 5–6. Wing, 2.90. Above, uniform olive-brown, a yellowish-white line over the eye; below, yellowish-white, thickly spotted or streaked with black or very dark olive, except on the middle of the abdomen and under tail-coverts.

Common transient visitant. Spring, April 25th (May 3d) to May 20th; autumn, August 3d to October 1st.

This bird is, essentially, a dark brown Ovenbird in build and general habits, but it is more active and always a bird of the water courses; walking along the hard sand and over some fallen log, or hopping from stone to stone with tail always bobbing up and down like a Sandpiper.

The song of the Water Thrush is one of the treats of spring time, and it is hard to realize that such a powerful song comes from so small a bird. Professor Jones has well represented it, "sweet, sweet, sweet, chu, chu, chu, chu, wee, chu."

675a Seiurus noveboracensis notabilis (Grinnell).

Grinnell's Water-Thrush.

Differs from the last in larger size and darker, sootier color above. Length, 5.50–6.50. Wing, 3.15.

One specimen was taken at Raritan, May 30th, 1889,[1] and another by Mr. W. E. D. Scott, at Princeton, September 10th, 1879.[2]

676 Seiurus motacilla (Vieillot).

Louisiana Water-Thrush.

Adults.—Length, 5.75–6.25. Wing, 3.15. Above, olive-brown, darker on the head and grayer on the back; a white line over the eye; below, white, streaked on the breast and sides with brownish-black. In autumn the sides are washed with buff.

Differs from the preceding species in the absence of spots on the throat and in the white color of the under parts as contrasted with the pale lemon tint of *S. noveboracensis.*

Young in first summer.—Similar, but throat as well as breast and sides streaked, and under tail-coverts and sides cinnamon.

Nest under an overhanging bank of leaves and rootlets; eggs, four to six, white, speckled with reddish-brown, .76 x .62.

Common summer resident in the lower Hudson Valley and along the upper Delaware; very rare migrant in south Jersey. Arrives April 15th, departs September 1st.

While common along the Delaware from Black's Eddy to Port Jervis, on the lakes of Sussex and Passaic counties (Rhoads) and on the lower Hudson, this Water-Thrush seems to be rare elsewhere in the State. Mr. Miller has found it, in summer, occasionally in notches of the trap ridge, north of Plainfield, and Mr. Babson secured a fledgeling, near Princeton, June 12th, 1900. Dr. Dwight found it, in summer, at Lake Hopatcong, and Mr. P. B. Philipp at Newton, Sussex county.

In southern New Jersey it seems to be unrecorded.

In habit, song and appearance it resembles the other Water-Thrush, but may be distinguished by the white instead of yellow underparts and the lack of spots on the throat.

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[1] Southwick, Auk, 1892, p. 303.

[2] Babson, Birds of Princeton, p. 75.

677 Oporornis formosa (Wilson).

Kentucky Warbler.

Adult male.—Length, 5–5.85. Wing, 2.60. Above, plain olive-green, with a black mask covering the sides of the face and top of head, the feathers of the crown tipped with gray; below, bright yellow, with a stripe of the same color over the eye and covering the posterior part of the orbital ring.

Adult female.—Similar, but black mask much duller and not so extensive.

Young in first summer.—Above, light sepia-brown; wings and tail, yellow; below, pale brown, becoming buffy-yellow on the abdomen and under tail-coverts.

Young in first autumn.—Similar to adult female, with black mask only partly developed and veiled with gray.

Nest of leaves and small twigs and rootlets on the ground; eggs, four to five, white, speckled with brown, .70 x .55.

Summer resident in the lower Hudson Valley and rarely in the middle Delaware Valley; almost unknown in the other parts of the State. Arrives April 30th (May 6th), departs September 1st.

The distribution of this bird is peculiar; a common breeder in the deep, rich woodlands of southeastern Pennsylvania; it seems to be entirely absent from the greater part of southern New Jersey, even as a migrant. Mr. Rhoads never saw it at Haddonfield, nor has it been found at Princeton by Mr. Babson, though Dr. C. C. Abbott states that it occurred there in 1864-7.

On the Pensauken Creek, nine miles east of Camden, Mr. C. J. Hunt found it breeding sparingly, and Mr. R. C. Harlow found a pair apparently breeding at Manahawkin, on the coast. This is in line with the distribution of many plants and animals which occur through northern New Jersey and sporadically on either side of the pine barrens, southward.

In the northern part of the State, however, the Kentucky Warbler does not seem to be generally distributed. Mr. Chapman reports it common at Englewood, in the Hudson Valley, and Mr. Holmes states that it occurs at Summit, but it is never found at Plainfield where Mr. Miller has searched for it.

The Kentucky Warbler is found on the ground or in the low bushes, now and then flying up on the branches of a tree to sing. Its loud, clear whistle fairly rings through the quiet wood; the syllables, "too-dle, too-dle, too-dle, too-dle," fairly represent its measures, while in quality it recalls the notes of the Carolina Wren or Cardinal, or at a distance reminds one of the song of the Ovenbird, given all in the same pitch.

678 Oporornis agilis (Wilson).

Connecticut Warbler.

Adult male.—Length, 5.20–6. Wing, 2.75. Above, plain olive-green; forehead, sides of head, throat and breast, slate-gray; rest of lower parts, pale yellow; a white ring around the eye. In autumn the top of the head is washed with brown.

Adult female.—Similar, but gray areas tinged with brown.

Young in first autumn.—Similar to the adult female, but throat and breast distinctly brown; eye ring, buff.

Common transient visitant in autumn; very rare in spring.

Spring, May 20th; autumn, September 1st to October 2d.

In autumn we find these birds in old fields along the edges of woods and thickets, especially in thick growths of rag weed; when approached they fly up into trees and bushes and remain until the intruder has passed by when they return to their feast. They are extraordinarily fat at this season.

In spring the Connecticut Warbler is almost unknown east of the Alleghanies; one of the very few specimens taken at this season, however, was obtained in New Jersey, by Mr. S. N. Rhoads, at Haddonfield, May 20th, 1882 (Collection W. Stone).[1]

679 Oporornis philadelphia (Wilson).

Mourning Warbler.

Adult male.—Length, 5–5.75. Wing, 2.40. Head, neck and breast, slate-gray; center of breast and bases of throat feathers, black; rest of upper surface, olive-green; lower surface, bright yellow, olive on the sides.

Adult female.—Lacks the black on the breast and throat, while the gray is paler below and more olive above.

Young in first autumn.—Similar to adult female, but duller.

Very rare transient visitant. Spring, May 15th to 30th; autumn, September 22d.

Mr. Chapman had taken but one, at Englewood, up to 1889,[2] but saw another May 22d, 1898.[3] At Morristown Messrs. Thurber and

[1] Abst. Proc. D. V. O. C., I., p. 6.

[2] Auk, 1889, p. 198.

[3] Abst. Proc. Linn. Soc., N. Y., XI., p. 4.

Green record two taken September 24th, 1885,[1] and Mr. Holmes, one seen at Summit, May 29th, 1904.

Dr. C. C. Abbott saw one, May 20th, 1906, at Trenton. Mr. Scott took one, September 22d, 1880, at Princeton,[2] and Mr. G. S. Morris obtained one on the Pensauken Creek near its mouth, May 30th, 1897.[3]

681 Geothlypis trichas (Linnæus).

Maryland Yellow-throat.

PLATE 74.

Adult male.—Length, 4.50–5.50. Wing, 2. Above, grayish olive-green, brownish on the back of the head; below, bright yellow from the chin to the middle of the breast; rest of under parts, pale buff to dull white; under tail-coverts, yellow; a jet black mask covering the sides of the face and forehead, bordered behind with grayish. In autumn, browner above and on the flanks, the black mask veiled with grayish edgings.

Adult female.—Similar, but lacks at all seasons the black mask.

Young in first summer.—Olive-brown above, olive-green on tail; tawny wood brown on the throat, chest and flanks; pale yellowish on the abdomen.

Young in first autumn.—Male similar to autumnal adult, but with only a trace of the black mask on the sides of the face below the eye; female similar to adult, but buff instead of yellow below.

Nest on the ground or in a tussock in low ground, quite large and made of leaves, bark, grass, etc.; eggs, three to five, white, speckled with brown and rusty brown, .70 x .50.

Abundant summer resident; arrives April 21st (April 28th), departs October 12th.

The Maryland Yellow-throat is universally distributed from one end of the State to the other, as much at home in the pine barrens as in the mountains, and from every swamp and low thicket comes his familiar song, "wichity, wichity, wichity, wichity."

The bird is Wren-like in its actions and in its inquisitiveness, bobbing in and out among the bushes, intent upon investigating any intruder who approaches its domain.

A single Yellow-throat was seen by Mr. Rhoads, at Haddonfield, on February 5th, 1890,[4] but its occurrence in winter is purely accidental.

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[1] O. and O., 1886, p. 92.
[2] Babson, Birds of Princeton, p. 76.
[3] Abst. Proc. D. V. O. C., III., p. 4.
[4] Stone, Birds of E. Pa. and N. J., p. 140.

683 Icteria virens (Linnæus).

Yellow-breasted Chat.

PLATE 74.

Adults.—Length, 6.75–7.50. Wing, 3. Above, uniform grayish olive-green; below, from the chin to the upper part of the abdomen, brilliant yellow; rest of under surface, white; a white line over the eye and another from the base of the bill, with a black spot between them in front of the eye.

Young in first summer.—Above, olive-brown; wings and tail tinged with green; below, ashy-gray.

Nest of leaves, strips of bark and grass in a bush about three feet from the ground; eggs, three to five, white, spotted with reddish-brown, .90 x .70.

Common summer resident throughout the southern, middle and northeastern parts of the State, excepting the pine barrens. Arrives April 29th (May 5th), departs September 15th.

The Chat is a bird of low thickets or clearings and is far more frequently heard than seen. At any time of day we may hear his queer jumble of notes pouring out of some brier thicket, a deliberate "kuk, kuk, kuk, kuk, kuk," in a high key and then on a much lower note and still more deliberate "caw, caw, caw," then several whistles and a high-pitched, rapid "kek, kek, kek, kek," a pause, and we approach to get a view of the performer, when we hear from another bunch of briers, farther on, a harsh derisive "tsheet, tsheet, tsheet, tsheet," in a guttural tone, if such a thing is possible in a bird. So the performance goes, apparently without any regularity or system. The action of the Chat is quite as peculiar as his song; he manages to conceal himself effectually and frequently to fly from one thicket to another without being seen, but on other occasions he mounts into the air and descends slowly with legs extended and wings flapping, all the while pouring out his varied notes in a most ludicrous flight song. One would hardly take the Chat for a Warbler, though it would be equally difficult to classify him elsewhere, and we are, therefore, willing to accept the evidence of less conspicuous structural characters and include him as an aberrant member of this large family.

The Chat breeds north to the New York line and farther along the Hudson, also at Summit (Hann and Holmes), Morristown (Thurber), Lake Hopatcong (Dwight), and Wallkill Valley, Greenwood and Beaver Lakes, Passaic county (Rhoads); also up the Delaware to High Knob and Port Jervis (Chapman).

684 Wilsonia citrina (Boddært).

Hooded Warbler.

PLATE 72.

Adults.—Length, 5–5.70. Wing, 2.60. Forehead and sides of face, bright yellow; rest of head, throat and breast, jet black; remainder of upper surface, olive-green; lower surface, bright yellow, paler on the under tail-coverts; two outer pairs of tail feathers mainly white on the inner web, next pair with a terminal white spot. Female usually with less black than male, with no black whatever in the first breeding season.

Young in first autumn.—Male similar to adult, but black everywhere veiled with yellow tips to the feathers; female with no black at all.

Nest of fine strips of bark, leaves and grass, situated in the crotch of a bush; eggs, four to five, white, with reddish-brown spots around the larger end, .70 x .50.

Common summer resident in the pine barren swamps in the lower Hudson Valley, and about Greenwood and Wawayanda Lakes (Rhoads); a rare transient elsewhere. Arrives April 30th, departs September 15th.

In the cedar swamps of the pine barrens, near Dennisville and Seaville, Cape May county, and Mays Landing, Atlantic county, I have found this Warbler quite plentiful, and Mr. Harlow has found it at Clementon. Its clear warble is easily recognized after it has once been heard, and has been represented by Mr. Langille, by the syllables "che-reé, che-reé, che-reé, chi-di-ee."

The Hooded Warbler is a beautiful bird, and in the cedar swamps the rich black and yellow of his plumage stand out with great distinctness.

In the lower Delaware Valley the bird is very rare, and Mr. Babson reports it as only a casual migrant at Princeton, and Mr. Miller as rare at Plainfield.

At Englewood, Bergen county, Mr. Chapman[1] states that it is an abundant summer resident, and according to Mr. Bowdish it is locally common at Demarest. Mr. Rhoads also found it at Alpine.[2]

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[1] Birds Vicinity of N. Y., p. 75.

[2] Cassinia, 1901, p. 50.

685 Wilsonia pusilla (Wilson).

Wilson's Warbler.

Adults.—Length, 5. Wing, 2.25. Above, olive-green, with a square, glossy, black crown patch; forehead, sides of face and entire under surface, yellow.
Young in first autumn.—Similar, but black cap veiled with olive in the male and usually lacking entirely in the female.

A regular but not common transient visitant. Spring, May 12th to 20th; autumn, August 20th to September 15th.

One of the later Warblers of the spring flight. Its song bears some resemblance to that of the Yellow Warbler.

686 Wilsonia canadensis (Linnæus).

Canada Warbler.

Adult male.—Length, 5–5.75. Wing, 2.60. Above, including sides of head, plain gray; feathers of the forehead and crown more or less centered with black; below, canary-yellow, with a necklace of black spots; a yellow line over the eye; spot in front and below the eye, black; under tail-coverts, white.
Adult female.—Similar, but duller; the spots of the "necklace" are dull gray.
Young in first autumn.—Similar to adult female.
Nest in a hollow on a bank among leaves and moss; eggs, four to five, white, with fine rufous spots, .65 x .50.

Common transient visitant. Spring, May 5th (May 12th) to May 30th; autumn, August 20th to October 1st. Also found by Mr. S. N. Rhoads to be a summer resident about the lakes of northern Sussex and Passaic counties, June 4th to 8th, 1909.

This is one of the later group of migrant Warblers, resembling somewhat the Magnolia on the under side but with the necklace spots smaller and no white on the tail.

The song is represented by Professor Jones as "tu tu tswee tu tu," the long middle note being pitched higher than the others.

687 Setophaga ruticilla (Linnæus).

Redstart.

PLATE 75.

Adult male.—Length, 4.75–5.75. Wing, 2.50. Upper surface, as well as entire head, neck and chest, glossy black; a broad band across the middle of the wing involving all but the tertials, bright orange or salmon, with faint

edgings of the same on the primaries; tail, with basal half of all but the two middle pairs of feathers, salmon; side of breast and under wing-coverts, bright salmon; center of breast and abdomen, white, with a few black streaks where the white and salmon join; under tail-coverts mixed with blackish. In autumn the black feathers of the breast are slightly tipped with buffy-white, especially posteriorly.

Adult female.—Head and back of neck, mouse-gray; back, olive; wings and tail, dusky; throat and breast, white, like the abdomen; salmon markings on wings, tail and sides replaced by pale yellow, those on the wings usually restricted to the secondaries.

Young in first summer.—Browner above and dull brown on the throat and breast.

Young in first autumn.—Similar to adult female.

Young in first breeding season.—Similar to adult female, but with some black feathers scattered irregularly on the head and throat.

Nest of fine shreds of bark and other vegetable fibers mixed with downy material, in the upright fork of a small tree; eggs, four to five, bluish-white, spotted around the larger end with dark brown and rusty, .65 x .50.

Common transient visitant and occasional summer resident in southern New Jersey. Common summer breeder in the northern counties. Arrives April 25th (May 3d), departs October 5th.

The Redstart is one of the most conspicuous of the migrant Warblers; the brilliant salmon red across the wings and tail is made more conspicuous by the nervous activity of the bird, which is constantly spreading its tail and fluttering out in the air, clear of the branches, in pursuit of some choice insect.

Its song Professor Jones compares with that of the Yellow Warbler, with the difference that it is retarded while that of the latter is accelerated toward the end. "Chee chee chee chee-pa."

In summer the Redstart is rather rare in southern New Jersey, but has been found nesting or observed in the nesting season in swampy locations in Cape May and Cumberland counties by Messrs. Reed and Wilde, at Haddonfield by Mr. Rhoads, at Manahawkin, Clementon, Bennett and Dennisville by Mr. Harlow, and by Professor A. H. Phillips, near Princeton. In northern New Jersey it is a common summer resident; Lake Hopatcong (Rhoads), Plainfield (Miller), near New York City (Chapman), High Knob (Chapman), Paterson (J. H. Clark), and rare at Summit (Holmes) and Morristown (Thurber).

Family MOTACILLIDÆ.

The Wagtails.

697 Anthus rubescens (Tunstall).

Titlark. Pipit.

Adults.—Length, 6–7. Wing, 3.30. Above, grayish olive-brown; tips of wing-coverts, buff, forming two bars; innermost wing feathers edged with the same; tail, blackish, outermost pair of feathers largely white, the next pair white tipped; under surface of body, buff to pale cinnamon, usually thickly spotted with brown on the breast and sides of throat and body; plumage much paler and under surface much faded in spring.

Common transient visitant along the seacoast, but more irregular inland; winter visitant in the most southern counties; March-May, October-November.

Titlarks are delicate, active little birds always found in flocks while with us; sometimes very large ones. They are further characterized as birds of bare open tracts, especially of sandy or burnt fields. They are, moreover, walkers, not hoppers, and are continually wagging their tails. On burnt ground it is difficult to distinguish them until one is nearly upon them, when they suddenly take flight, displaying for a moment their white outer tail feathers, and with a faint "dee-dee" are whirling up and up, until they drift away like wind-blown leaves.

I have found them in very large flocks at Cape May, January 2d, 1892.

Family MIMIDÆ.

The Mockers.

The birds of this family are allied to both the Wrens and the Thrushes. They comprise three of our best-known species famous both for their song and their value as insect destroyers.

a. Slaty-gray above and below. — Catbird, p. 295
aa. Gray above, white below. — Mockingbird, p. 294
aaa. Rusty brown above, streaked below. — Brown Thrasher, p. 296

703 Mimus polyglottos (Linnæus).

Mockingbird.

Adults.—Length, 9–11. Wing, 4.60. Upper parts, ashy-gray, wings and tail more brownish; basal portion of primaries, white; three outer tail feathers largely white; under parts, white, tinged with gray.

Young in first summer.—Similar, but speckled below with dusky.

Nest of twigs, grass, rootlets, etc., in a bush; eggs, four to six, pale bluish, spotted and blotched with reddish-brown, .95 x .72.

Very rare summer resident.

The Mockingbird at the beginning of the last century seems to have been of regular occurrence in the vicinity of Philadelphia, and, according to Dr. B. S. Barton, was a resident bird, though Wilson says they arrived about April 20th from the south. A significant statement which is also made by the latter (writing about 1810) is that "the eagerness with which the nest of the Mockingbird is sought after in the neighborhood of Philadelphia has rendered this bird extremely scarce for an area of several miles around the city. The continued popularity of the species as a cage bird down to the present time has almost effected its extermination north of southern Delaware." Turnbull in 1869 says, "It is now rare."

Its decrease in New Jersey was doubtless coincident with its reduction in Pennsylvania. Jacob Green[1] mentions it as apparently a familiar bird at Princeton in 1817, and in 1868 Dr. C. C. Abbott says: "Have seen but few specimens during the past seven years, and found but one nest." Mr. G. N. Lawrence states that they bred on Barnegat Beach in 1866.[2]

Mr. F. M. Chapman,[3] on authority of Mr. Martin, reports a nest at Tenafly, three miles north of Englewood, about 1876. The female was killed, however, and nothing more was seen of the species until 1884, when a pair nested in the same garden; the young were taken and reared in confinement, and although the male bird returned in the spring of 1885, nothing was seen of them after that date.

Rev. Samuel Lockwood[4] states that Mockingbirds were plentiful about Keyport in 1832, but had entirely disappeared by 1880, though

[1] Doughty's Cab. Nat. Hist., II., pp. 7–10.
[2] Ann. Lyc., N. Y., VIII., p. 279.
[3] Auk, 1889, p. 304.
[4] Amer. Nat., 1892, p. 635.

one pair were present in 1882. A colony still existed on Sandy Hook at least to 1892, though it suffered severely in the blizzard of 1888.

Mr. Henry Hales states that a pair bred near Ridgewood in 1884, and one bird was seen in November, 1902.[1]

On August 27th, 1891, I secured a single bird at Cape May Point, and Mr. W. L. Baily got a young one in juvenal plumage in 1895 at Holly Beach. In August, 1897, Mr. Baily saw an adult at Cape May, one at Ocean View, March 30th, 1901, and another at Wildwood, December 27th, 1903. Mr. D. N. McCadden saw two at Stone Harbor, September 4th, 1903, and Miss C. Murphy reported one at Point Pleasant throughout the winter of 1902-3.

At Beach Haven Mr. I. N. DeHaven saw one during the summer of 1906, and Mr. John Lewis Childs records a pair at Barnegat all summer in 1900.[2]

Professor A. H. Philipps secured a young one near Princeton some years ago.[3]

704 Dumetella carolinensis (Linnæus).

Catbird.

PLATE 76.

Adults.—Length, 8–9.25. Wing, 3.60. Above and below, slate-gray, paler beneath; entire top of head as well as tail, black; under tail-coverts, chestnut. Female sometimes with the black a little duller.

Young in first summer.—Dull gray, indistinctly mottled with brown edgings below, and lacking the black cap; under tail-coverts, brownish.

Nest of leaves, twigs and grass and occasionally pieces of paper, in thickets; eggs, three to five, deep greenish-blue, .95 x .70.

Common summer resident. Arrives April 21st (April 29th), departs October 18th.

Equally at home in the swampy thickets or in the shrubbery of the garden, the Catbird is familiar to all. The gray dress and the irritating, complaining cry serve to identify him.

His song is a medley of notes similar to that of the Thrasher, but more subdued, and usually given from the very middle of some dense clump of bushes.

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[1] Bird Lore, 1904, p. 134.
[2] Auk, 1900, p. 390.
[3] Birds of Princeton, p. 77.

The Catbird is a trustful bird, nesting about our houses just as long as we leave him some dense shrubbery and some fallen leaves among which to scratch for food. Half of the Catbird's food consists of insects—ants, grasshoppers and caterpillars for the most part. Of his vegetable diet part is garden fruit, but the bulk consists of wild berries. Where the Catbird proves destructive, a simple expedient is the planting of wild cherry trees or other wild fruit, which is always preferred to cultivated kinds.

In the southern counties, especially along the coast, and casually further north, the Catbird occurs as a straggler in winter. Dr. C. C. Abbott has found them at Trenton, Mr. Rhoads[1] secured one at Atlantic City, December 26th, 1892, Mr. D. N. McCadden[1] another at Avalon, February 11th, 1894, and Dr. W. E. Hughes[2] one at Stone Harbor, December 31st, 1905, while Mr. W. L. Baily[3] saw several at Holly Beach in the winter of 1897-8, Mr. W. D. W. Miller[4] saw one at Plainfield, December 30th, 1897, and W. B. Evans saw one at Moorestown, December 25th, 1903.[5]

705 Toxostoma rufum (Linnæus).

Brown Thrasher.

PLATE 77.

Adults.—Length, 11–12. Wing, 4.30. Above, bright cinnamon rufous; below, white, faintly tinged with buff on the sides and strongly streaked with black across the lower neck and breast and down the sides of the body, some of the streaks passing to cinnamon on the sides of the breast; under tail-coverts, buff; wing-coverts dusky towards the end and tipped with buffy-white, forming two wing bars. In autumn the buff wash below is stronger.

Young in first summer—Similar, but streaked above with dull brown.

Nest a bulky structure of twigs lined with rootlets in low bushes or on the ground: eggs, three to five, grayish-white, minutely speckled all over with cinnamon-brown, 1.05 x .80.

Common summer resident. Arrives April 1st (April 24th), departs October 22d. Casual in winter.

The Thrasher is a conspicuous bird in thickets and along fence rows

[1] Stone, Birds of E. Pa. and N. J.
[2] Cassinia, 1906, p. 58.
[3] Abst. Proc. D. V. O. C., III., p. 3.
[4] Osprey, II., p. 91.
[5] Bird Lore, February, 1904.

and edges of woodlands. We see him more frequently running along ahead or skulking through the bushes, easily recognized by his long tail and bright rufous coloration. Again, he is a familiar sight at early morning or evening, on the top of some tree with tail drooping and head thrown back, pouring out a song of which any bird might well be proud and which alone would confirm his relation to the Mockingbird. A grand medley of notes and whistles, each one exactly duplicated or sung in pairs.

The Thrasher, from his rusty color and spotted breast, is frequently confused with the Thrushes and not infrequently called Brown Thrush. His relationship, while partly with the Thrushes, is also quite as much with the Wrens, so that he is to some extent a connecting link.

In a few instances Thrashers have been seen in winter. One was seen at Englewood, January 31st, 1885, by Mr. Chapman[1] and another upon another occasion,[2] while Mr. W. L. Baily saw several at Holly Beach in the winter of 1897-8,[3] one February 22d, 1894,[4] and two December 27th, 1903.[5]

Family TROGLODYTIDÆ.

The Wrens.

These little birds are among our most famous insect destroyers and deserve the most careful protection. They are also songsters of the highest ability.

a. Longitudinal white streaks on the back.
  b. Bill, .40. — Short-billed Marsh Wren, p. 300
  bb. Bill, .50–.60. — Long-billed Marsh Wren, p. 301
aa. No longitudinal white streaks on the back.
  b. A conspicuous stripe over the eye and along the side of the crown.
    c. Wing, 2.05–2.20, dark brown above. — Bewick's Wren, p. 298
    cc. Wing, 2.20–2.60, bright rusty above. — Carolina Wren, p. 298
  bb. No stripe over the eye.
    c. Tail less than 1.50. — Winter Wren, p. 300
    cc. Tail over 1.75. — House Wren, p. 299

[1] Auk, 1889, p. 305.
[2] Foster, Abst. Linn. Soc., N. Y., V., p. 3.
[3] Abst. Proc. D. V. O. C., III., p. 3.
[4] Abst. Proc. D. V. O. C., II., p. 12.
[5] Bird Lore, February, 1904.

718 Thryothorus ludovicianus (Latham).

Carolina Wren.

PLATE 78.

Adults.—Length, 5.25–6. Wing, 2.35. Above, uniform russet or rufous chestnut, darker on the head; wings and tail barred with dusky and small white terminal spots on the wing-coverts; large concealed white spots on the base of the upper tail-coverts; under surface, white, washed with cinnamon, especially on the sides and flanks; under tail-coverts with narrow brown bars; a conspicuous white line over the eye narrowly bordered with black; plumage duller in summer.

Young in first summer.—Similar, but somewhat mottled with dusky beneath.

Nest large, made of grass, moss, leaves, feathers, etc., placed in holes in walls and buildings, or in hollow trees, etc.; eggs, four to six, white, spotted with rusty and pale purple at the larger end, .74 x .60

Common resident in southern New Jersey and the lower Hudson Valley; rare elsewhere.

The Carolina Wren is the largest of our Wrens, a bird of the woods and thickets, always in song, winter as well as summer. The song is a loud clear whistle resembling those of the Tufted Titmouse and Cardinal, birds which have almost the same distribution. The most common variations have been excellently given by Mr. Chapman as "whee-udle, whee-udle, whee-udle" and "tea-kettle, tea-kettle, tea-kettle." The bird has also a fluttering note like the "bleat" of a tree-toad, which is uttered with numerous bobbings of the body as he hops about, disturbed by some intruder.

The Carolina Wren is common throughout southern New Jersey, especially in the western part. It is rare at Princeton (Babson), rare and irregular at Plainfield (Miller), but more common in the lower Hudson Valley (Chapman) from Fort Lee to Piermont.

719 Thryomanes bewicki (Audubon).

Bewick's Wren.

Adults.—Length, 5.25. Wing, 2.15. A miniature Carolina Wren in shape and proportions, but duller in color, being exactly the same shade as the House Wren. Distinguished from the latter by the white line over the eye and white tips and bars to the three outer pairs of tail feathers.

Rare straggler from the south.

Mentioned in Beesley's Cape May list (1857), and given by Turnbull as rare. Dr. C. C. Abbott, in his list of New Jersey birds (1868), says: "Rare; more abundant some seasons than others." In 1876[1] he emphasizes this statement, saying: "I have not failed to find a considerable number of them for several years past; they return year after year." But in 1884[2] he says a few pairs occurred some years ago, and in 1895[3] refers to it only as "a western species."

The only other record that I know of is one bird seen at Haddonfield by Mr. S. N. Rhoads in 1890.

721 Troglodytes aëdon (Vieillot).

House Wren.

PLATE 78.

Adults.—Length, 4. Wing, 2. Above, brown, becoming rufescent on the rump; tail and wings and sometimes the back, barred with black; below, dull white, washed with russet on the flanks and slightly buffy on the breast; flanks and under tail-coverts barred with black; a pale line over the eye and large, round, white concealed spots on the base of the upper tail-coverts.

Young in first summer.—Similar, but darker below and mottled from chin to abdomen with dusky edgings to the feathers.

Nest in bird boxes, old Woodpeckers' holes, etc., made of twigs, lined with feathers, grass, etc.; eggs, six to eight, vinaceous, minutely speckled with darker, .65 x .52.

Common summer resident. Arrives April 21st (April 27th), departs October 5th.

The House Wren is one of our familiar home birds, but one which seems to have become less common of late years, in some sections at least.

Its cheerful warble used to be heard from every garden, but now, from the persecution of English Sparrows or from some other cause, it is only a migrant in certain localities. In autumn the House Wren takes to the fence rows and edges of woodland. Mr. S. N. Rhoads saw one bird, at Haddonfield, close at hand, early in February, 1909, which had evidently wintered in a lumber yard.

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[1] Amer. Nat., 1876, p. 237.

[2] Naturalists' Rambles about Home.

[3] Birds about Us.

The Wrens are wholly beneficial, ninety-eight per cent. of their food consisting of insects; grasshoppers, bugs, caterpillars and spiders being the most important articles of diet.

722 Nannus hiemalis (Vieillot).

Winter Wren.

PLATE 78.

Adults.—Length, 3.50–4. Wing, 1.85. Above, russet brown, brighter on the rump and tail; wings, tail, and posterior half of back more or less distinctly barred with black, light areas on the outer wing feathers paler; under surface pale cinnamon; flanks, abdomen and under tail-coverts barred or mottled with black and dull white; a pale line over the eye; some concealed white spots on the basal parts of the upper tail-coverts.

Tolerably common winter resident. Arrives September 25th, departs April 20th.

This little short-tailed edition of the House Wren takes its place with us during the winter, inhabiting brush piles, and bobbing in and out under the banks of streams. His note while with us is an inquisitive little "pip-pip" as he bobs up and down on his short legs, with no suspicion of the wonderful tinkling melody that pours from his throat in his northern forest home.

724 Cistothorus stellaris (Lichtenstein).

Short-billed Marsh Wren.

Adults.—Length, 3.75–4.50. Wing, 1.75. Above, head and back, black; streaked with brownish white; forehead and nape, nearly uniform brown; rump and upper tail-coverts, rusty, the latter barred with black and dull white; wings and tail, blackish brown, barred with light brown and dull white; lower surface, dull white; sides of body, breast and under tail-coverts, cinnamon.

Young in first summer.—Duller and paler below.

Nest a globular structure of woven grass on or near the ground; eggs, six to eight, pure white, .64 x .48.

Summer resident in the northern part of the State; common locally; rare winter visitant or transient in southern New Jersey.

This bird is known to me only as a rare transient or winter visitor in the swamps of southern New Jersey, where it is usually flushed

from the dead grass only to drop back again into the welcome shelter after a short bobbing flight.

Specimens have been taken at

Beach Haven; October 3d, 1882. S. N. Rhoads.

Haddonfield; September 17th, 1890. S. N. Rhoads (Coll. W. S.).

Cape May; January 28th, 1892. W. Stone (Coll. W. S.).

Cape May; January 29th, 1892. S. N. Rhoads (Coll. W. S.).

May's Landing; October 25th, 1892. S. N. Rhoads (Coll. W. S.).

Princeton; September 25th, 1897. W. E. D. Scott (Coll. Princeton).

Princeton; October 9th, 1898. W. A. Babson.

In the Great Swamp, Morris county, Mr. Larue K. Holmes and Mr. H. H. Hann found this Wren breeding commonly; Mr. Harold Herrick found them on the Passaic meadows, near Chatham,[1] and Mr. S. N. Rhoads found them nesting abundantly in the Wallkill Valley, northern Sussex county, June 11th, 1909. Mr. Dallas Lore Sharp found a pair on the Delaware Bay meadows in late June (see Holmes, Cassinia, 1904, page 17, where an excellent account of the species in New Jersey is given), and Mr. W. B. Crispin found a nest near Salem, June 5th, 1909.

725 Telmatodytes palustris (Wilson).

Long-billed Marsh Wren.

Adults.—Length, 4.25–5.50. Wing, 1.95. Above, head and middle back, blackish-brown, the latter streaked with white and a white line over the eye; sides of back, shoulders and rump, lighter brown, becoming rusty; wings, brown, the innermost feathers edged with black and brown spotted; central tail feathers, brown, narrowly barred with black, others blackish, more coarsely barred with brown on both webs; under surface, white, tinged with cinnamon on sides and flanks. Plumage exceedingly worn and faded in summer.

Young in first summer.—Duller, with the white streaks above almost obsolete.

Nest globular, woven of grass and cat-tail leaves, supported on cat-tails, calamus or small bushes; eggs, five to nine, uniform chocolate-brown or very finely speckled, .64 x .45.

Common summer resident mainly in coast and tidewater swamps. Arrives May 10th, departs October 15th.

In the breeding season the cat-tail swamps are fairly full of the bubbling songs of the Marsh Wrens, which always seem to contain

[1] Forest and Stream, XII., p. 165.

something of the moist quality of the bird's surroundings. The birds, with tails turned up over their backs, sway up and down on the reed-stalks or bob in and out of the nests, which surround one on every side.[1]

They occur abundantly at Cape May and other coastal swamps all the way to New York, and also up the Delaware to Trenton. I have found them breeding above tidewater at May's Landing; Professor Phillips has found nests at Duck Pond, near Princeton,[2] and Mr. Miller reports them in Great Swamp, near Plainfield, and on the Raritan; Mr. P. B. Philipp found them abundant at Newton, Sussex county. As an illustration of the abundance of the nests of this bird in marshes where colonies are established, and also as an example of the extent to which the egg-collecting mania may be carried, we may quote Mr. B. B. Haines, who states that he has known a collector, near Elizabeth, to obtain from 400 to 500 eggs in a day.[3]

At Cape May Mr. Rhoads and I found them wintering in small numbers, January 28th, 1892.[4]

Family CERTHIIDÆ.

THE CREEPERS.

726 Certhia familiaris americana (Bonaparte).

Brown Creeper.

PLATE 79.

Adults.—Length, 5–5.75. Wing, 2.50. Above, brown, each feather with a central grayish-white streak; rump, rusty; tail, grayish-brown; wings, brown, spotted on both webs of the feathers with white or gray; below, grayish-white.

Nest behind loose pieces of bark hanging to tree trunks, made of chips, moss, cobwebs, etc.; eggs, four to six, white, spotted with reddish-brown, .58 x .48.

Tolerably common winter resident, more abundant in migrations. Arrives September 20th, departs April 15th. Summer resident in the mountains of Sussex county.

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[1] *Cf.* C. J. Hunt, Cassinia, 1904, pp. 17–25, for account of habits in N. J.

[2] Birds of Princeton, p. 79.

[3] O. and O., 1883, p. 6.

[4] Auk, 1892, p. 204.

The Creeper appears to be more like a mouse than a bird, as he goes slowly up the tree trunks by short jumps, clinging close to the bark and examining every crack for insects that may be lurking there. Upon reaching the upper part of the tree, he dives down to the root of the next one, and starting often only a few inches from the ground, again begins the ascent.

His only note, while with us, consists of several thin wiry "seeps."

His food is wholly insectivorous. Mr. P. B. Philipp has taken nests in the Tamarack Swamp, at Newton, Sussex county, in May and June, 1906, 1907 and 1908, and regards the species as a rare but regular breeder in that locality.

Family SITTIDÆ.

The Nuthatches.

Small birds allied to the Titmice, but peculiar in their climbing habits, usually progressing downwards along the trunks of trees instead of upwards like the Woodpeckers.

a. Top of head black or gray.	
b. Wing, 3.50 or over.	White-breasted Nuthatch, p. 303
bb. Wing less than 3.	Red-breasted Nuthatch, p. 304
aa. Top of head brownish.	Brown-headed Nuthatch, p. 305

727 Sitta carolinensis Latham.

White-breasted Nuthatch.

PLATE 79.

Adult male.—Length, 5.25–6. Wing, 3.60. Above, bluish-gray; whole top of head and nape, glossy black; below, including sides of face and neck, grayish-white; thighs and part of under tail-coverts, chestnut; wing feathers blackish, edged and tipped with blue-gray or white, innermost ones blue-gray with oval black spots and white tips; greater-coverts with white tips forming a bar; middle pair of tail feathers, blue-gray; others, black, varied with white, forming a diagonal band across each half of the tail when spread.

Adult female.—Similar, but black of head veiled with blue-gray, seldom showing distinctly except on the nape.

Young in first summer.—Duller, with feathers of the upper surface edged with dusky.

Nest in a hole in a tree, composed of leaves, feathers, etc.; eggs, five to eight, white, speckled with rusty and pale purple, .80 x .60.

Common resident, most abundant in winter.

While equally a bird of the tree trunks, the Nuthatch takes exactly the opposite view of life from the Brown Creeper; hanging head down, with his short stubby tail pointed up, he explores the tree from top to bottom, ending where the Creeper begins. He often runs around the trunk or out on horizontal limbs, and occasionally upwards, but his preference is to travel upside down.

His note, uttered now and then at intervals in his search for food, is a peculiar nasal, "ank, ank, ank," sounding much farther away than it really is.

In winter we frequently find a number of insectivorous birds hunting together in a mixed band—Nuthatches, Downy Woodpeckers, Creepers, Chickadees and Kinglets making up the company.

728 Sitta canadensis Linnæus.

Red-breasted Nuthatch.

Adult male.—Length, 4.25–4.75. Wing, 2.75. Above, uniform bluish-gray, including wings and middle pair of tail feathers; others, black, with diagonal subterminal white bars on the two outer pairs; top of head, nape and sides of head to below the eye, glossy black; cheeks, chin and a line over the eye, pure white; lower surface of body, rusty chestnut (much paler in spring).

Adult female.—Similar, but with head mainly dark gray above and lower parts paler.

Irregular transient visitant, sometimes abundant in autumn and remaining, in small numbers, throughout the winter; very rare in other years, always scarce in spring. Arrives September 10th, departs May 15th. In the spring of 1900, after being abundant all winter, two pairs were noticed at Princeton beginning to make excavations in old trees, but they did not remain to breed.[1]

Habits similar to those of the White-breasted Nuthatch. Distinguished by its small size, the black band through the eye and rusty under parts.

Note higher and thinner, not so emphatic.

[1] Babson, Birds of Princeton, p. 79.

729 Sitta pusilla Latham.

Brown-headed Nuthatch.

Adults.—Length, 4–4.40. Wing, 2.60. Upper parts, blue-gray, except the head and nape, which are brown; wings, dusky; tail, dusky, two outer feathers with subterminal white spots, central pair gray; under parts of body, white, tinged with buff.

Very rare straggler from the south. Beesley gives it in his list of Cape May birds (1857), and Turnbull states that it is a rare visitant to the southern counties, but does not specify whether he referred to Pennsylvania or New Jersey. The only definite occurrence is a single bird observed by Mr. S. N. Rhoads, at Haddonfield, in winter, about 1876. It came to feed on suet fastened to a tree near the window.

Family PARIDÆ.

The Titmice.

Small arboreal birds, our species all of gray plumage; especially conspicuous in winter as they search the tree-tops for food, frequently hanging, head down, from the slender twigs.

a.	Head crested gray.	Tufted Titmouse, p. 305
aa.	Head not crested, black.	
b.	Wing, .20, longer than tail.	Carolina Chickadee, p. 307
bb.	Wing equal to or shorter than the tail.	Black-capped Chickadee, p. 306

731 Baeolophus bicolor (Linnæus).

Tufted Titmouse.

PLATE 80.

Adults.—Length, 5.75–6.50. Wing, 3.25. Head, crested; color above, plain slate-gray, including wings and tail; below, grayish-white, flanks strongly washed with cinnamon; forehead, black; eye region, whitish, with a small black spot just above the orbit.

Young in first summer.—Browner above, with the crest and black forehead much less developed.

Nest in a hole in a tree, made of feathers, leaves, grass, etc.; eggs, five to eight, white, spotted with reddish-brown, .74 x .54.

Common resident in the southern half of the State, north to Orange (Riker) and Plainfield (Miller); north of this it occurs only as a straggler.

The Tufted Tit has much the same habits as the Chickadee; searching the tree-tops for insects, and on crisp winter mornings we can hear his loud, clear whistle for considerable distances through the woods, "tú-lee, tú-lee, tú-lee, tú-lee," reminding one somewhat of certain notes of the Carolina Wren. At other times we surprise him, low down in some bushy thicket, and he then indulges in a rapid "dee-dee-dee-dee," which takes the place of the Black-cap's "chick-a-dee" in his repertoire.

Mr. Chapman has observed the Tufted Tit at Englewood in April, but it does not nest there. It was heard by Dr. Dwight at Lake Hopatcong, and Mr. P. B. Philipp found one pair breeding at Newton, Sussex county, June, 1908. At Summit (Holmes and Callender), Chatham (H. B. Bailey)[1] and at Morristown (Thurber) it breeds regularly.

735 **Penthestes atricapillus** (Linnæus).

Black-capped Chickadee.

PLATE 80.

Adults.—Length, 4.75–5.75. Wing, 2.60. Above, olive-gray, tinged with buff on the rump; below, white, washed with buff on the sides; entire top of the head and nape, black; sides of the face and neck, pure white; throat and fore neck, black, the posterior feathers frosted with white, most marked in winter; wings and tail, blackish, edged with grayish-white; nearly pure white on the innermost wing feathers and outermost tail feathers.

Young in first summer.—Duller in color.

Nest in a hole in a tree, made of feathers, grass, hair and bark fiber; eggs, five to eight, white, spotted with reddish-brown mainly on the larger end, .55 x .45.

Common resident in the northern half of the State, probably not breeding south of the Raritan (Miller); rather rare winter visitant in southern New Jersey.

The Chickadee is one of our most familiar and fearless birds, full of curiosity and activity, going through the trees in little bands, from branch to branch, hanging upside down to explore the under side of a

[1] Auk, 1886, p. 410.

twig and occasionally coming down to the tall weed stalks. The usual call is the familiar "chick-a-dee, chick-a-dee-dee-dee," while in the nesting and breeding season there is the clear whistle "tee dee," the first a high note, the second much lower.

In the vicinity of Princeton and Haddonfield, and probably elsewhere in south Jersey, the Chickadee occurs in winter along with the resident Carolina Chickadee.

736 Penthestes carolinensis (Audubon).

Carolina Chickadee.

Adults.—Length, 4.25–4.50. Wing, 2.45. Coloration like the preceding species, but the wing and tail edgings narrower and grayer, never pure white. *Nest* and eggs similar to those of the Black-cap; size, .53 x .43.

Common resident throughout southern New Jersey, north to Princeton, but more plentiful in the pine barrens than elsewhere.

This is the Chickadee of the southern half of the State and a characteristic bird of the pine barrens. In habit, as in coloration, it resembles the Black-cap; the notes are similar but the "chick-a-dee" is said to be higher pitched, while the whistle is lower.

Family SYLVIIDÆ.

The Kinglets and Gnatcatchers.

A small group of little birds representing the Warblers of the old world.

a. Plumage olive or olive-gray above.
b. A black stripe on each side of the crown.
Golden-crowned Kinglet, p. 308
bb. No black stripes on the crown. Ruby-crowned Kinglet, p. 308
aa. Plumage bluish-slate above. Blue-gray Gnatcatcher, p. 309

748 Regulus satrapa (Lichtenstein).

Golden-crowned Kinglet.

PLATE 81.

Adult male.—Length, 3.25–4.50. Wing, 2.20. Above, grayish-olive, brighter on the rump; wing and tail feathers, blackish, edged with olive; wing-coverts tipped with white, forming two bars on each wing; below, grayish-white, crown with two broad black bands bordered on the inside with yellow and including a brilliant orange central patch; a grayish-white band across the forehead and back over the eyes immediately below the black.

Female.—Similar, but lacks the orange center to the crown patch, the entire area between the black stripes being lemon-yellow.

Rather common winter resident. Arrives September 30th, departs April 20th.

This diminutive little bird is a familiar winter species, especially among evergreens, where he finds insects enough to satisfy his need throughout the cold months.

749 Regulus calendula (Linnæus).

Ruby-crowned Kinglet.

PLATE 81.

Adult male.—Length, 3.75–4.50. Wing, 2.25. Above, grayish-olive, brighter on the rump; wing and tail feathers, blackish, edged with olive; tips of the wing-coverts, whitish, forming two bars across each wing; below, grayish-white; a patch of bright vermilion-red on the crown and a nearly complete white ring around the eye.

Female.—Similar, but lacks the red crown patch.

Common transient visitant. Spring, April 2d (April 12th) to May 1st; autumn, September 15th to November 1st.

Krider[1] says it winters in the New Jersey cedars, and C. J. Hunt records one at Lakewood, December 9th, 1901.[2]

The two Kinglets occur together during migrations, but this one seems the most abundant. He comes earlier in the fall and lingers longer in the spring, at which season he occasionally favors us with a splendid bit of song, a fine, clear, varied warble that is hard to believe can be produced by so small a bird.

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[1] Field Notes, p. 26.

[2] Bird Lore, 1902, p. 28.

751 Polioptila cærulea (Linnæus).

Blue-gray Gnatcatcher.

Adult male.—Length, 4.25–5.50. Wing, 2.10. Above, bluish-gray, brightest on the head; a narrow black band across the forehead and back over the eyes; wings, dull black, edged with gray, the innermost feathers with white; tail, jet black, the outermost pair of feathers largely white, the next two pairs with white tips, diminishing in extent; below, white, with a slight grayish-tint.

Female and young during the first summer and autumn.—Similar, but without the black frontlet.

Nest not unlike a large Hummingbird's nest, made of grasses and vegetable fibers and covered with lichens; usually placed on a horizontal limb of a tree; eggs, bluish-white, thickly spotted with brown and rufous, .58 x .45.

Rare and local summer resident in southern New Jersey. Arrives April 10th to May 1st, departs September 3d.

The Gnatcatcher is a very rare bird in this State, but two nests have been found, so far as I am aware; one at Bridgeton, by W. L. Baily, the other at Cape May Point, by S. N. Rhoads, May 17th, 1903,[3] though Beesley (1857) gives it as a breeder in Cape May county.[1]

The following species have been obtained:

Princeton; April 28th, 1875. W. E. D. Scott (Princeton Coll.).[2]

Cape May county; April 15th, 1879. Dr. W. L. Abbott (Acad. Nat. Sciences, Phila.).

Woodbury; May 1st, 1880. Dr. W. L. Abbott, three specimens (Acad. Nat. Sciences, Phila.).

Haddonfield; April 10th, 1882. S. N. Rhoads (Collection W. Stone).[4]

Dennisville; May, 1891. C. A. Voelker.[4]

Atlantic City; April 16th, 1893. I. N. DeHaven, four specimens[4] (Coll. Academy of Natural Sciences and I. N. D.).

Cape May Point; April 11th, 1903. C. J. Pennock.[3]

According to Mr. Babson, Mr. Scott has taken other specimens at Princeton, but no nest was ever found there, and although regarded as regular in 1878, by Scott,[5] it is not so now. Mr. Chapman mentions a

[1] Geology of Cape May.
[2] Babson, Birds of Princeton, p. 81.
[3] Cassinia, 1903, p. 75.
[4] Stone, Birds of E. Pa. and N. J., p. 148.
[5] The Country, 1878, p. 354.

number of specimens taken near New York City, but only stragglers and not from New Jersey.

The Gnatcatcher is as small as the Kinglets, with some of their habits and some of those of the Chickadee. His song is very low pitched.

Family TURDIDÆ.

The Thrushes, Robins and Bluebirds.

The members of this family are generally regarded as our finest songsters, their notes being peculiarly sweet and musical.

Their most conspicuous structural characteristic is the so-called "booted" tarsus, the plates on the front of the tarsus being welded together into one long piece.

The typical Thrushes are very similar to one another, being brown above and white beneath, with the breast more or less speckled. The familiar Robin and Bluebird differ widely in color, and have plain breasts, but their young show the characteristic spotted breast of the Thrush family.

a. General color above blue, breast rusty red. Bluebird, p. 315
aa. General color above dusky, head and tail black, breast rusty red. Robin, p. 314
aaa. General color above brown or olive-brown, breast white or buffy, more or less speckled or streaked.
b. Head and back brighter brown than the tail, which inclines to olive; spots below large, round and black. Wood Thrush, p. 311
bb. Upper parts uniform reddish-brown, markings below faint and brownish, confined to the throat and upper breast. Veery, p. 311
bbb. Tail more rusty brown than the back. Hermit Thrush, p. 313
bbbb. Upper parts uniform olive-brown.
c. Throat, upper breast and sides of face deep buff. Olive-backed Thrush, p. 313
cc. Throat, breast and sides of face grayish-white. Gray-checked Thrush, p. 312 Bicknell's Thrush, p. 313

755 Hylocichla mustelina (Gmelin).

Wood Thrush, Wood Robin.

PLATE 82.

Adults.—Length, 7.50–8.25. Wing, 4.10–4.50. Tawny-brown above, brightest on the head, duller and more olive on the tail; below, white, slightly tinged with buff on the breast; sides of neck, entire breast and sides of abdomen marked with large blackish spots.

Young in first summer with more or less pale streaks and spots on the back and wing-coverts.

Nest of leaves, fine twigs, plant stems and mud, placed in a small tree eight to ten feet up; eggs, three to four, greenish-blue, 1.05 x .70.

Common summer resident. Arrives April 24th (April 30th), departs October 1st.

No low, rich woodland is without at least a pair of Wood Thrushes, and as soon as one enters the cool shade he hears either the clear, flute-like modulated song, or the metallic "put-put-put" of their alarm note.

The Wood Thrush is the largest and most heavily spotted of any of our Thrushes, the only one in which the spots run down below the breast.

His food is seventy-five per cent. insects and the rest wild berries.

The Wood Thrush is not a shy bird; he will frequent shady village streets as well as the more remote woodland, but he must have shade and prefers nearness to water. In the pine barrens he is restricted to the cedar swamps.

756 Hylocichla fuscesens (Stephens).

Veery, Wilson's Thrush.

Adults.—Length, 6.50–7.75. Wing, 3.90. Above, uniform tawny-brown; below, white, strongly tinged with buff across the breast, and a slight brown tint on the sides of the body; breast and sides of throat with numerous small tawny-brown spots.

Young in first summer with pale spots above.

Nest of leaves, fine roots and strips of bark on the ground or in the base of a bush; eggs, three to five, greenish-blue, .90 x .65.

Common summer resident in the northern counties; transient visitant in the southern half of the State. Arrives April 26th (May 2d),

departs September 20th. Absent from the southern part of New Jersey May 30th to August 20th.

As a migrant the Veery is simply one of the several smaller Thrushes that pass silently through our woods twice a year, differing from each other only in shade of color.

As a summer resident, however, it is one of the leaders among our famous songsters. The song is hard to describe; "weird" and "unearthly" gives some notion of its character, while the syllables, "twee-le-ah, twee-le-ah, twee-la, twee-la," represent the notes, but the quality is peculiar among bird music. At a distance it has something of the tinkling of bells, or it has been likened to whistling down a gun barrel, or to a series of chords instead of single notes.

Occasionally, in south Jersey, I have heard late migrants indulge in a low song,[1] but usually it is reserved for the summer home, where the Veery is constantly heard but seldom seen, since he frequents thick woods and has a faculty for concealing himself.

Mr. Babson[2] has seen Veeries in June a short distance north of Princeton and thinks they nest there; about Plainfield they breed regularly (Miller), also at Summit (Callender and Holmes) and Lake Hopatcong (Rhoads), South Orange (H. B. Bailey),[3] Ridgewood (Fowler), Paterson (Clark), Alpine (Rhoads), &c.

757 Hylocichla aliciæ (Baird).

Gray-cheeked Thrush.

Adults.—Length, 7–7.75. Wing, 4– . Above, olive-brown, very slightly browner on the tail; below, white, tinged with buff on the breast and brown on the sides of the body; breast and sides of the throat spotted with blackish, spots becoming paler towards the abdomen; sides of face and cheeks, grayish-brown. Very similar to the Olive-backed Thrush, but always distinguished by the differently colored cheeks.

Common transient visitant. Spring, May 3d (May 12th) to May 30th; autumn, September 20th to October 10th.

Distinguished from the Olive-backed Thrush by the gray instead of buff cheeks. Similar in habits.

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[1] *Cf.* Cassinia, 1905, p. 93; 1901, p. 49.

[2] Birds of Princeton, p. 81.

[3] Auk, 1886, p. 489.

757a Hylocichla aliciæ bicknelli Ridgway.

Bicknell's Thrush.

Adults.—Length, 6.25–7.25. Wing, 3.65. Coloration exactly like the Gray-cheeked Thrush or a trifle browner above; size smaller.

Rare transient visitant. Spring, May; autumn, September 10th to October 5th (Babson).

A small edition of the Gray-cheek. Mr. Babson records it from Princeton, but we have no record from southern New Jersey, though it doubtless occurs.

758a Hylocichla ustulata swainsoni (Cabanis).

Olive-backed Thrush.

Adults.—Length, 6.50–7.50. Wing, 4. Above, uniform olive-brown; below, white, strongly tinged with buff across the breast and with paler brown on the sides of the body; breast and sides of throat thickly spotted with blackish, spots becoming paler towards the abdomen; cheeks and sides of face strongly tinged with buff like the breast.

Common transient visitant. Spring, April 30th (May 7th) to May 25th; autumn, September 15th to October 15th.

A silent member of the spring migratory host, and frequent in autumn about the poke berry bushes and dogwood.

759b Hylocichla guttata pallasi (Cabanis).

Hermit Thrush.

Adults.—Length, 6.50–7.50. Wing, 3.50. Above, olive-brown; tail, bright tawny; below, white, tinged with buff on the breast and pale brown on the sides of the body; breast with numerous large blackish spots, becoming paler towards the abdomen.

Young in first summer with light spots above.

Common transient visitant and occasional winter resident, especially in the southern counties. Morristown, January 30th, 1886 (Thurber and Green), Plainfield, winter of 1901-2 (Miller), and

every year in the pine barrens and along the coast islands of Cape May county. Spring, April 1st (April 13th) to May 4th; autumn, October 10th to November 5th.

The Hermit passes through earlier in the spring and later in the fall than the other migrant Thrushes, and is particularly welcome in winter, when we not infrequently find one or two about some woodland spring or in some dense thicket.

In parts of Sussex county it may possibly be found to breed.

761 Planesticus migratorius (Linnæus).

Robin.

PLATE 83.

Adult male.—Length, 9–10. Wing, 4.90–5.40. Above, dark slate-gray; head, sides of face, tail and long wing feathers, black; a white spot over and under the eye and on tip of outer pair of tail feathers; next pair slightly margined with white at tip; below, bright cinnamon rufous, except the throat, which is white streaked with black, and center of abdomen and under tail-coverts which are white, the latter mixed with black. In late fall and winter the upper parts are tinged with olive and the feathers of the under surface are edged with whitish.

Adult female often rather duller than the male.

Young in first summer mottled with black and white spots above and with white tips to many of the wing feathers; below, nearly white, in the middle of the breast, strongly tinged with cinnamon rufous on the sides and thickly spotted with black.

Nest of mud and grass lined with fine grass; placed on the limb of a tree, or sometimes on old buildings; eggs, three to five, greenish-blue, 1.15 x .80.

Abundant summer resident and occasional resident; regularly so along the southern coast. Arrives February 14th (March 4th), departs November 10th.

The Robin is, perhaps, our best known bird; the frequenter of gardens, orchards and lawns, one cannot help knowing him. In the southern counties he winters regularly, especially just back of the seacoast, where large flocks may always be found.

After the nesting season the Robins frequent regular roosts during the night, and in autumn course about the country in flocks, descending on the dogwood and other berry-bearing trees.

The Robin gets many a bad name on account of his raid on the cherry trees, but his case is not so bad as some would have us think.

The Department of Agriculture has shown that nearly half of his food is animal, fully one-third being noxious insects and seven per cent. earth worms. Of the fruit and berries eaten only one-tenth is cultivated. The cherries, ripening before any wild fruit is available, are the main source of his early summer food. As a protection the planting of Russian mulberries is suggested, as they ripen at the same time as the cherries and are much preferred by the birds.

The shooting of the Robins is ineffective, as it is impossible to exterminate them or for the gunner to stay on guard all the time; furthermore, it destroys a bird which is a valuable insect destroyer at all other seasons, and a songster we could ill afford to lose.

763 Ixoreus nævius (Gmelin).

Varied Thrush.

Adults.—Length, 9–10. Wing, 4.90–5.20. Slate above, outer tail feathers with white spots at tip; wings, dusky, with four transverse bands of rusty; below, rusty, with a black breast band; ear-coverts, black; line over the eye, rusty.

Very rare and accidental straggler from the west.

Dr. Samuel Cabot procured a specimen in Boston, March, 1848, that had been shot in New Jersey,[1] while another, taken at Hoboken, December, 1851, is recorded by Mr. G. N. Lawrence.[2]

766 Sialia sialis (Linnæus).

Bluebird.

PLATE 84.

Adult male.—Length, 5.75–7. Wing, 4. Above, uniform bright blue; sides of the face rather duller; throat, breast and flanks, cinnamon-chestnut; abdomen and under tail-coverts, white. In autumn and winter the feathers of the upper surface are veiled with chestnut and those of the lower parts with whitish.

Adult female.—Above, bluish-gray, becoming bright blue on the rump, tail and outer edges of wings; below, pale cinnamon rufous on the breast and sides

[1] Proc. Bost. Soc. Nat. Hist., May, 1848, p. 17.

[2] Ann. Lyc. Nat. Hist., N. Y., V., p. 221.

of body; throat paler and abdomen and under tail-coverts white; winter plumage browner above.

Young in first summer.—Above, brownish-gray, back streaked with white; tail and outer edge of wings, blue; below, white, feathers of the breast, throat and sides of body edged with brown, producing a mottled or scaled appearance.

Nest in a hollow tree or box, made almost wholly of grass; eggs, four to five, bluish-white, .80 x .60.

Common summer resident and occasional resident. Arrives February 17th (March 2d), departs November 10th.

The soft warble of the Bluebird has come to be recognized as the announcement of spring's arrival, and we look eagerly for the bird on every warm day of February.

In southern New Jersey, and elsewhere locally, the Bluebird's presence has less significance, as small flocks find shelter in the thickets all winter long, and even on days that are anything but spring-like, we can hear their low "tur-lur, tur-lur."

The Bluebird seems to have been one of the chief sufferers from the introduction of the English Sparrow, and many a bird box formerly inhabited by these beautiful Americans is now the domicile of the ever present foreigner, recalling the deserted old homesteads that one sees now and then converted into shelters for gangs of Italian laborers.

Bibliography of New Jersey Ornithology.

Apart from the casual allusions to birds made in the journals of some of the early voyagers who entered the mouth of Delaware Bay, the first work to contain notes on New Jersey birds is Peter Kalm's Travels, in which are comments on various species observed by him during his stay at the Swedish settlement of Raccoon, on the Delaware, in 1749. The great classics of American ornithological literature, the works of Wilson, Audubon and Nuttall, contain many references to the birds of the State, while in later years the ornithologists of Philadelphia and New York, as well as resident naturalists, have published many lists and notes dealing with New Jersey birds. The following list contains all the more important books and papers relating to the ornithology of the State and shorter notes or papers dealing with special species:

1753–61. Kalm, Peter. En Resa Til Norra America, &c. Stockholm, Vols. I.–III.

First English Edition, 1770-71, for bird matter, *cf.* Trotter, *Auk*, 1903, p. 249.

1799. Barton, B. S. Fragments of the Natural History of Pennsylvania. Philadelphia, folio pp. i.–xviii. and 1–24.

As Philadelphia naturalists have never been able to stay on their own side of the Delaware River, it is probable that Barton's observations relate in part to New Jersey.

1808–1814. Wilson, Alexander. American Ornithology. Philadelphia, Vols. I.–IX.

The text of the last volume is by George Ord. Wilson's excursions into New Jersey seem to have been in the immediate vicinity of Camden, and along the coast from Beesley's Point and Ocean City to Cape May City.

1815. Ord, George. Zoology in the Second American Edition of Guthrie's Zoology.

The Bonaparte's and Ring-billed Gulls are here described from the Delaware River.

1817. Ord, George. An account of an American Species of the genus Tantalus or Ibis. *Jour. Acad. Nat. Sci., Phila.,* I., p. 53

Plegadis autumnalis from Egg Harbor.

1824–5. Ord, George. Additional matter in Wilson's American Ornithology (second edition).

The new matter is mainly in Vols. VII.–IX., which were much amplified.

1825–33. Bonaparte, Chas. L. American Ornithology, Vols. I.–IV. Philadelphia.

Virtually a continuation of Wilson, containing a few references to New Jersey birds.

1826–28. Bonaparte, Chas. L. The Genera of North American Birds and a synopsis of the species found within the territory of the United States. *Ann. Lyc. Nat. Hist., New York,* ii., pp. 7–128, 293–451.

A few mentions of New Jersey.

1828. Bonaparte, Chas. L. Further Additions to the Ornithology of the United States. *Ann. Lyc. Nat. Hist., New York,* ii., pp. 154–161.

Tringa himantopus discovered in New Jersey.

1828–9. Ord, George. Additional matter in Wilson's American Ornithology (Hall Edition, Vols. I.–III., and Vol. of Plates).

1830. Anonymous. Woodcock Shooting. *Doughty's Cabinet of Natural History,* I., pp. 97–99.

In New Jersey.

1831–39. Audubon, J. J. Ornithological Biography, Vols. I.–V., Edinburgh.

Audubon's references to New Jersey birds are based upon a residence of several months (middle of May to middle of September, 1829) at Camden, a visit to Egg Harbor [Beesley's Point] in June, 1829, and a few excursions with his friend, Edward Harris, who resided at Moorestown. He also quotes observations of Mr. Harris and of Dr. James Trudeau.

1832. GREEN, JACOB. Notes of a Naturalist. *Doughty's Cabinet of Nat. Hist.*, Vol. II., pp. 7–10 and 53–56.

Chronological notes at Princeton, N. J., following the plan of Barton's Fragments of Nat. History.

1832. I. The Variety of Game in New Jersey. *Doughty's Cabinet of Nat. Hist.*, II., pp. 15–18.

Pinnated Grouse almost exterminated on the "plains."

1832. RUSTICUS. My Favorite Walks. *Doughty's Cabinet of Nat. Hist.*, Vol. II., pp. 95–96.

In New Jersey.

1832. EDITOR. Hudsonian Godwit. *Doughty's Cabinet of Nat. Hist.*, Vol. II., p. 158.

Discovery of this species in New Jersey at Cape May by T. R. Peale, in May, 1828.

1832–1834. NUTTALL, THOMAS. A manual of the ornithology of the United States and of Canada. Vols. I. and II. Cambridge and Boston.

Nearly all references to New Jersey are quotations from Wilson or Audubon, which is remarkable when we consider how much time Nuttall had spent in the State pursuing his botanical investigation.

1836. ORD, GEORGE. Observations on the Cowbunting. *Loudon's Magazine*, IX., p. 55.

Mentions nest of *Dendroica vigorsii* ["*Sylvia pinus*"] found by Wilson near the coast of New Jersey, May, 1813.

1837. WARD, J. F. Notice of the Pine Grosbeak (*Pyrrhula enucleator*) in the environs of New York. *Ann. Lyc. N. Y.*, IV., p. 51.

1844. CASSIN, JOHN. On the abundance of *Strix nyctea* about Philadelphia. *Proc. Acad. Nat. Sci., Phila.*, II., p. 19.

One hundred shot in Pennsylvania and New Jersey, winter 1843–4.

1844. GIRAUD, J. P. Birds of Long Island.

Refers to the Heath Hen and some other birds in New Jersey.

1846. Lawrence, Geo. N. Description of a New Species of Anser. *Ann. Lyc. N. Y.*, IV., p. 171.
Branta nigricans from New Jersey coast.

1848. Samuel Cabot. European Widgeon taken in New Jersey. *Proc. Bost. Soc. Nat. Hist.*, III. p. 21.
Cf. also *do.* VI., p. 376.

1848. Herbert, Henry Wm. Frank Forester's Field Sports of the United States and British Provinces of North America.—(Numerous subsequent editions).
Includes accounts of wild fowl of the New Jersey coast.

1851. Cassin, John. Notice of an American species of Duck hitherto regarded as identical with the *Oidemia fusca L. Proc. Acad. Nat. Sci., Phila.*, V., p. 126.
O. velvetina [*O. deglandi Bp.*] described from Egg Harbor.

1852. Lawrence, Geo. N. Ornithological Notes. *Ann. Lyc. N. Y.*, V., p. 220.
Varied Thrush and Pine Grosbeak from New Jersey.

1853. Herbert, Henry Wm. (Frank Forester). American Game in Its Seasons. N. Y. 1853.

1853. Krider, John. Sporting Anecdotes Illustrative of the Habits of Certain Varieties of American Game. Phila., 1853.
Refers to New Jersey birds.

1855. Cassin, John. Remarks on the appearance of *Loxia leucoptera* in great numbers in the vicinity of Philadelphia. *Proc. Acad. Nat. Sci., Phila.*, VII., p. 203.

1855. Cassin, John. Remarks on *Crex pratensis*, a specimen of which was obtained from Salem, New Jersey. *Proc. Acad. Nat. Sci., Phila.*, VII., p. 265.

1857. Beesley, Thos. Catalogue of the birds of the County of Cape May, in Geology of the County of Cape May, N. J., by Wm. Kitchell.
Briefly annotated list of 196 species at pp. 138-145. The following are among the species starred to indicate that they breed in the county. That

none of them do breed in the county is certain, and it may be that the placing of stars opposite them was purely a printer's error. With the exception of the last two they do not even breed in the State: White-throated Sparrow, Tree Sparrow, Myrtle Warbler, Black-poll Warbler, Yellow-palm Warbler, Ruby and Golden-crowned Kinglets, Golden-winged Warbler and Black-throated Green Warbler. There are interesting references to birds in the historic chapter by Dr. Maurice Beesley.

1857. Lewis, Elisha J. The American Sportsman. Containing hints to sportsmen, notes on shooting, the habits of the game birds and wild fowl of North America. Phila.

Refers to birds of New Jersey coast.

1858. Baird, Spencer F.; Cassin, John, and Lawrence, Geo. N. Explorations and surveys for a railroad route from the Mississippi River to the Pacific coast. Vol. IX., Birds. Washington, pp. i.–lvi. and 1–1005.

In the catalogue of specimens a number of New Jersey specimens are listed.

1866. Lawrence, Geo. N. Catalogue of birds observed in New York, Long and Staten Islands and adjacent parts of New Jersey. *Ann. Lyc., New York,* VIII., pp. 279–300.

Several important New Jersey records: *Dryobates borealis, Mimus polyglottos, Piranga rubra* and *Scolopax rusticola.*

1868. Trippe, T. M. The Dwarf Thrush. *Amer. Nat.,* II., p. 380.

Records of Hermit (?) Thrush and Bohemian Waxwing at Orange, N. J.

1868. Abbott, C. C. Catalogue of vertebrate animals of New Jersey. Cook's Geology of New Jersey, App. E., pp. 751–830.

This publication is noteworthy as being the first general list of New Jersey birds. No less than 301 species are given, but unfortunately the data accompanying the records of rare species are very incomplete and unsatisfactory, while many statements about the time of occurrence of species in the State, especially as regards the breeding season, are wholly at variance with the experience of all other ornithologists who have since studied the birds of New Jersey.

The following species are mentioned as breeding or as occurring throughout the summer in New Jersey, although no one else has been able to verify Dr. Abbott's statements, and unfortunately the latter are not supported by any exact dates or localities or by any specimens: Pigeon Hawk, Hermit Thrush, Olive-backed Thrush, Ruby-crowned Kinglet, Golden-crowned Kinglet, Winter Wren, Red-bellied Nuthatch, Brown Creeper, Blackburnian Warbler, Northern Shrike, Fox Sparrow, Rusty

Blackbird, Saw-whet Owl, Yellowlegs, Greater Yellowlegs, Solitary Sandpiper, Mallard, Blue-winged Teal, Green-winged Teal, Bufflehead Duck.

In Dr. Abbott's "Birds About Us," published in 1895, he omits New Jersey from the breeding range of many of these species, notably the Olive-backed Thrush, Kinglets, Winter Wren, Red-bellied Nuthatch, Rusty Blackbird and Fox Sparrow. In his publications of 1870 and 1884 (see below), however, he endorsed most of the above statements and even added other "breeders" of the same class.

1869. TURNBULL, W. P. The Birds of East Pennsylvania and New Jersey. Philadelphia, 8vo., pp. i.–viii., 1–50. Also an identical Glasgow edition and a larger quarto with vignettes.

This is our first reliable list of the birds of Pennsylvania and New Jersey.

1870. ABBOTT, C. C. The Marsh Harrier. *Amer. Nat.*, IV., p. 377.

Comment on scarcity of males in New Jersey.

1870. ABBOTT, C. C. Night Herons. *Amer. Nat.*, IV., p. 377.

In the city of Trenton.

1870. ABBOTT, C. C. Notes on certain inland birds of New Jersey. *Amer. Nat.*, IV., pp. 536–550.

1871. THORPE, T. B. Bird Shooting on the Coast of New Jersey.—Appleton's Journal, VI., Sept. 1871, p. 379.

1872. LOCKWOOD, SAMUEL. The Great Nothern Shrike and the English Sparrow. *Amer. Nat.*, VI., p. 236.

Shrikes and birds of prey as enemies of the Sparrows.

1872. ABBOTT, C. C. Occurrence of the Scissor-tailed Flycatcher in New Jersey. *Amer. Nat.*, VI., p. 367-8.

Shot on Crosswick's Meadows, five miles below Trenton, April 15th.

1873. TRIPPE, T. M. The Irregular Migrations of Birds. *Amer. Nat.*, VII., pp. 389–394.

Sudden appearance of Great-crested Flycatcher at Orange, N. J., and absence of Red-headed and Hairy Woodpeckers.

1873. TRIPPE, T. M. The Golden-winged Woodpecker. Notice of *Colaptes auratus* x *mexicanus* at Orange, New Jersey. *Amer. Nat.*, VII., 1873, p. 498.

1874–1884. Baird, S. F.; Brewer, T. M., and Ridgway, R. History of North American Birds. Land Birds, 1874, Vols. I.–III.; Water Birds, Vols. I., II., 1884.

Contains a few references to New Jersey, probably all compiled.

1874. Abbott, C. C. The Kinglets in New Jersey. *Amer. Nat.*, VIII., pp. 364–365.

Still maintains they nest in New Jersey, but gives no data.

1874. Brewer, T. M. The Kinglets in New Jersey. *Amer. Nat.*, VIII., p. 502.

1874. Herrick, Harold. Description of a new species of Helminthophaga. *Proc Acad. Nat. Sci., Phila.*, 1874, p. 220.

Type of *H. lawrencei* taken in New Jersey.

1874. Trippe, T. M. The Migration of Birds. *Amer. Nat.*, VIII., 338–348.

Refers to Connecticut Warbler, Tree Swallow and Hawk flights.

1875. Abbott, C. C. Notes on the habits of certain Thrushes. *Rod and Gun*, VI., p. 86, May 8th, 1875.

At Trenton, N. J.

1876. Abbott, C. C. Bewick's Wren. *Amer. Nat.*, X., p. 237.

"Have not failed to find a considerable number for several years past."

1876. Abbott, C. C. My February Field Notes.—*Forest and Stream*, VI., Mar. 23d, 1876, pp. 99–114. March Notes do., April 20th, p. 163. Three Months of Field Notes do. Aug. 10th, pp. 3, 20.

1876. Abbott, C. C. The occurrence of White Egrets at Trenton, N. J. *Amer. Nat.*, X., pp. 473–476.

The Snowy Heron arrived in numbers August 14th, and some American Egrets August 17th. The Little Blue Herons "are always here and caused no comment." Yet, according to Dr. Abbott, no White Herons had been seen for several years in any numbers. As the Little Blue Herons are always far more plentiful in the white plumage at this time, and as the species has not known to breed in the Delaware Valley, so far as the experience of others goes, it would seem probable that Dr. Abbott's (Snowy Herons) were really the immature Little Blue Herons. Similar flights have occurred since.

1876. Pierce, M. P. Scarcity of Birds in New Jersey.—*Forest and Stream,* VI., March 16th, 1876, p. 84.

1877. Herrick, H. Capture of a second specimen of Helminthophaga lawrencei. *Bull. Nutt. Orn. Club,* 1877, p. 19.
Hoboken, N. J., spring 1876.

1878. Huyler, A. I. Winter Birds on the Hackensack.—*The Country,* I., p. 149.

1878. Scott, W. E. D. Some Princeton Birds.—*The Country,* I., p. 354.

1879. Dwight, J., Jr. The Stilt Sandpiper on the New Jersey coast. *Bull. Nutt. Orn. Club,* 1879, p. 63.
Ten shot at Squan Beach September 1st, 1879.

1879. Herrick, H. Notes on some birds of Chatham, New Jersey. *Forest and Stream,* April 3d, 1879, p. 165.
Notes on twenty-six species rare or of special interest.

1879. Nichols, G. L. Migration of some Warblers through Summit, New Jersey, during the last spring. *Forest and Stream,* July 17th, 1879, p. 464.

1879. Scott, W. E. D. Late fall and winter notes on some birds observed in the vicinity of Princeton, New Jersey, 1878-79. *Bull. Nutt. Orn. Club,* 1879, pp. 81–85.
Many valuable observations.

1879. Scott, W. E. D. Notes on birds observed at Long Beach, New Jersey. *Bull. Nutt. Orn. Club,* 1879, pp. 222–228.
The most important paper on our coast birds.

1879. Treat, M. Notes on the intelligence of birds. *Lippincott's Magazine,* xxiv., September, 1879, pp. 359–364.

1879. Zarega, L. A. Capture of a Fish Crow near Seabright, Monmouth county, New Jersey. *Bull. Nutt. Orn. Club,* 1879, p. 239.

1880. ABBOTT, W. L. Passerculus princeps in New Jersey. *Forest and Stream*, XIV., p. 44.
One shot at Seven Mile Beach December 30th, 1879.

1880. ALLEN, J. A. Destruction of birds by lighthouses. *Bull. Nutt. Orn. Club*, 1880, p. 134.
Reference to Cape May Light.

1880. HALES, HENRY. The birds on a farm. *Oologist*, 1880, p. 74. At Ridgewood, New Jersey.
Nesting of Rose-breasted Grosbeaks and Bobolinks.

1880. LOCKWOOD, S. A Black Robin. *Bull. Nutt. Orn. Club*, 1880, p. 46.
At Freehold, N. J.

1880. SCOTT, W. E. D. Golden-winged Woodpeckers nesting in a natural cavity in a decayed tree. *Bull. Nutt. Orn. Club*, 1880, p. 56.
At Princeton, N. J.

1880. ZAREGA, L. A. Notes on the northern range of the Fish Crow, with some account of its habits. *Bull. Nutt. Orn. Club*, 1880, pp. 205–208.
Regularly to Seabright and less so to Sandy Hook.

1881. BREWSTER, W. On the relationship of *Helminthophaga leucobronchialis* and *H. lawrencei*, &c. *Bull. Nutt. Orn. Club.*
Nyack, N. J.

1881. DUTCHER, W. Great Carolina Wren. *Forest and Stream*, XVI., July 14th, 1881, p. 473.
Specimen taken at Greenville, N. J.

1881. SCOTT, W. E. D. Occurrence of *Vireo philadelphicus* in Mercer county, New Jersey. *Bull. Nutt. Orn. Club*, 1881, p. 56.
Two shot, September 21st and 28th, 1876.

1881. SCOTT, W. E. D. Some observations on the migration of birds. *Bull. Nutt. Orn. Club*, 1881, p. 97 and p. 188.
Through a telescope at Princeton.

1881. Scott, W. E. D. The White-bellied Swallow on the New Jersey Coast in November. *Bull. Nutt. Orn. Club,* 1881, p. 115.
Abundant at Squan Beach November 16th, 1880.

1881. Scott, W. E. D. The Ipswich Sparrow at Squan Beach, New Jersey. *Bull. Nutt. Orn. Club,* 1881, p. 116.
One shot November 16th, 1880, by G. R. Hardenbergh.

1882. Homo. English Widgeon on the New Jersey Coast. *Forest and Stream,* XVIII., March 2d, 1882, p. 86.
Several killed at Tuckerton and Little Egg Harbor. Hutchin's Goose killed at Tuckerton.

1882. Rhoads, S. N. Nesting of *Empidonax minimus* and *Helmintherus vermivorus* in Pennsylvania and New Jersey. *Bull. Nutt. Orn. Club,* 1882, p. 55.

1882. Wescott, C. S. Occurrence of the Snow Goose in Delaware Bay. *Forest and Stream,* XVII., January 5th, 1882, p. 447.
Remained at Bombay Hook all winter.

1883. Abbott, C. C. Occurrence of the Swallow-tailed Kite in New Jersey. *Science,* Vol. II., No. 29, p. 222.

1883. B. B. The Clapper Rail. *Orn. and Oölogist,* p. 39, 40.
Seven hundred eggs collected for sale.

1883. Bellows, C. E. Rare Birds. *Ornithologist and Oologist,* VIII., p. 16.
"Common Cormorant (*Phalacrocorax carbo*)" taken at Bridgeton, N. J.

1883. Haines, B. B. Long-billed Marsh Wren. *Ornithologist and Oologist,* VIII., p. 6.
Nesting habits in New Jersey.

1883. Haines, H. F. Breeding of the Virginia Rail at Elizabeth, New Jersey. *O. and O.,* VIII., p. 7.

1883. Morgan, T. Nest of *Totanus melanoleucus* found at Somerville, New Jersey. *Ornithologist and Oologist,* VIII., p. 67.

1883. RHOADS, S. N. Early Capture of the Orange-crowned Warbler. *Bull. Nutt. Orn. Club,* 1883, p. 179.
Haddonfield, N. J., March 22d, 1883.

1884. B. B. The Wood or Summer Duck. *Orn. and Oölogist.*
Nests on Passaic River and in Ocean county.

1884. T. B. A. The Egret (in New Jersey). *Forest and Stream,* February 14th, p. 44.

1884. T. B. A. The Least Bittern. *Forest and Stream,* February 7th, p. 25.
Its abundance in New Jersey.

1884. BARRELL, H. F. Arrival of Birds at New Providence, Union County, New Jersey (1883). *O. and O.,* 1884, p. 45.

1884. BELLOWS, C. E. The Willet (*Symphemia semipalmata*) Breeding in Delaware Bay. *Forest and Stream,* June 5th, p. 364.

1884. RIKER, C. B. Crossbills in New Jersey. *Forest and Stream,* May 15th, p. 302.

1884. SHERRATT, W. J. (=W. J. Rogers). European Skylark in New Jersey. *O. and O.,* 1884, p. 24.

1884. SHERRATT, W. J. Brünnich's Murre on Great Bay, New Jersey. *O. and O.,* 1884, p. 48.

1884. ABBOTT, C. C. A Naturalist's Rambles about Home. D. Appleton & Company, 1884, 8vo., p. 485.
In this work Dr. Abbott presents a list of the birds of Mercer county, New Jersey, in which he reiterates many of the statements made in his State list of 1868 about the nesting of various birds, and adds some species as summer residents which no other ornithologists have found in the State at this season. There is the same lack of data that characterized the earlier list. *Cf.* J. A. ALLEN, *Auk,* 1885, p. 86, for critical review.

1885. BARRELL, H. F. Birds of Upper Passaic Valley, N. J. *O. and O.,* 1885, pp. 21 and 42.
Unreliable. A number of species listed as breeders which do not nest in New Jersey. No details given.

1885. Riker, C. B. A specimen of *Helminthophila leucobronchialis* in New Jersey. *Auk,* 1885, p. 378.
Maplewood, Essex county, May 11th, 1883.

1886. Abbott, C. C. Upland and Meadow.

1886. Allen, J. A. *Aegialitis meloda circumcincta* on the New Jersey coast. *Auk,* 1886, p. 482.

1886. Bailey, H. B. The Cardinal Grosbeak and Tufted Titmouse, breeding in Essex county, N. J. *Auk,* 1886, p. 410.

1886. Bailey, H. B. Wilson's Thrush, breeding at South Orange, N. J. *Auk,* 1886, p. 489.

1886. Brewster, W. An interesting specimen of *Helminthophila. Auk,* 1886, p. 411.
Intermediate between *H. lawrencei* and *H. pinus,* taken at Morristown, N. J., May 15th, 1884, by Frank Blanchet.

1886. Chapman, F. M. The Lark Finch in New Jersey. *Auk,* 1886, p. 136.
Specimen secured at Schraalinburgh, November 26th, 1885.

1886. Chapman, F. M. Additional specimen of *H. leucobronchialis* at Englewood, N. J. *Auk,* 1886, p. 411.

1886. Chapman, F. M. The Barn Owl at Englewood, N. J. *Auk,* 1886, p. 485.

1886. Old Salt. A day among the Fish Hawks (includes breeding of Least Bittern at Sea Isle, N. J.). *Oologist,* 1886, p. 49.

1886. Parker, H. G. A Two Days' Collecting Trip on the New Jersey Coast. *O. and O.,* 1886, p. 138.
A valuable account of bird life on Seven Mile Beach.

1886. Rhoads, S. N. Crow Roosts and Roosting Crows. *Amer. Nat.,* 1886, pp. 691 and 777.
The most extensive paper on the subject up to this time.

1886. Thurber, E. C., and Green, M. M. Winter Birds of Morristown, N. J. *O. and O.,* 1886, p. 90.

1886. THURBER, E. C., and GREEN, M. M. Notes on the Fall Migration from Morristown, N. J. *O. and O.,* 1886, p. 92.

1886. THURBER, E. C. *Helminthophila leucobronchialis* in New Jersey. *Auk,* 1886, p. 411.
Taken May, 1859, at Morristown, by Aug. Blanchet.

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1889. Chadbourne, A. P. An Unusual Flight of Killdeer Plover Along the New England Coast. *Auk,* 1889, pp. 255-263.
Navesink, N. J., December 15th, 1888.

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1889. Chapman, F. M. Notes on Birds Observed in the Vicinity of Englewood, N. J. *Auk,* 1889, pp. 302-305.

1889. Foster, L. S. The Snowy Owl in New Jersey in November, 1889. *Forest and Stream,* November 28th, 1889.

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"Mr. Stone, with the assistance of his fellow-members of the Delaware Valley Ornithological Club, has presented us with a faunal list which, except in unimportant details, may well stand as a model for works of this nature. * * * The work is well and tastefully printed, typographical errors are rare, and we congratulate Mr. Stone and his associates on having performed their task in a manner which demands the highest commendation."—*The Auk,* N. Y. City.

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1895. Burns, F. L. Notes from Southern New Jersey. *Auk,* 1895, p. 189.

Phalaropus lobatus, two killed May 23d, 1894. Nest of *Ammodramus henslowii* found May 22d on Peck's Beach.

1895. Abbott, C. C. The Birds About Us.

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Female taken at Red Bank, Monmouth county, September 28th, 1889.

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Glossary of Technical Terms

Abdomen. The belly.

Auriculars. Feathers covering the ear.

Axillaries. Rather elongated feathers growing from near the juncture of the wing and the body, seen only when the wing is raised.

Cere. The naked skin surrounding the nostrils in Hawks, Pigeons, etc.

Crissum. The lower tail-coverts.

Coverts. Small feathers covering the upper and middle part of the wing and upper and under part of the tail.

Culmen. The ridge or keel of the upper mandible.

Ear-coverts. Fine feathers overlying the ear opening.

Ear-tufts. Erectile tufts of feathers on each side of the forehead as in the owls. They have nothing to do with the ears.

Gape. The opening of the mouth.

Gonys. The keel of the lower mandible from the tip to where it branches.

Interscapulars. Feathers of the back; between the shoulders.

Lore. The space between the eye and the bill.

Malar region. Side of the lower jaw behind the bill.

Mantle. Back, scapulars and wings of Gulls and some other birds in which this area is peculiarly colored.

Mandible. The jaw.

Nape. Upper portion of the hind neck.

Nasal. Pertaining to the nostrils.

Nuchal. Pertaining to the nape.

Occipital. Pertaining to the back part of the head.

Primaries. The quill feathers that grow from the hand or outer section of the wing, usually nine or ten in number.

Primary coverts. Smaller stiff feathers immediately overlying the base of the primaries.

Rectrix. One of the long tail feathers of a bird.

Remex. A primary or secondary of the bird's wing.

Rictal. Pertaining to the corner of the mouth or gape.

Rump. That part of the lower back immediately above the upper tail-coverts.

Scapular region. A longitudinal band of feathers on each side of the back.

Secondaries. The long stiff quill feathers growing from the forearm or second section of the wing.

Speculum. The bright-colored patch on a duck's wing.

Superciliary. Above the eye.

Tarsus. The (usually bare horny) part of the bird's leg between the toes and the heel joint. Really part of the foot rather than the leg.

Tertials. The three innermost secondaries which are usually graduated and differently colored from the others.

Vermiculated. Marked with irregular fine lines.

PART III.

Notes on New Jersey Fishes, Amphibians and Reptiles

By HENRY W. FOWLER,

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1. Notes on New Jersey Fishes.

This account is a record of my observations made during the past season, together with such information as I have been able to gather from apparently reliable sources. Several recent additions to the fauna are here noted. Mr. J. B. Vanderveer, of Trenton, and Dr. R. J. Phillips, of Philadelphia, have kindly furnished me with some interesting notes.

Family PETROMYZONIDÆ.

Petromyzon marinus Linnæus.

Lamprey. Lamper. Lamper Eel.

Mr. Emlen Martin reports a large example about three feet long taken in the Rancocas Creek, at Centerton, Burlington county, during the spring of 1908.

Mr. J. B. Vanderveer says that at Trenton and below, in the Delaware, they would formerly appear in spring and early summer in all the shad and herring fisheries. They attached themselves to shad, herring or carp, removing the scales at the point of attachment to rasp off the flesh and thus be enabled to suck the blood. Fish so attacked soon become weak, and often an infested shad has been seen swimming laboriously behind the main school. On one occasion a shad with two rather small lampreys of about nine or ten inches in length, one dangling from each opercle, was seen swimming in this way. The young do not seem to be known or be used by the fishermen. Lampreys run in the tributary creeks or smaller streams in the spring and early summer to spawn. Large ones, reaching four or five pounds in weight, were met with, and when about their nesting were very pugnacious, viciously attempting the defensive, though harmless. Lampreys were not used as food by the fishermen.

Family CARCHARIIDÆ.

Carcharias littoralis (Mitchill).

Sand Shark.

A large shark, about eight feet long, evidently this species, was reported late in August of 1908 by Mr. W. J. Fox, from Sea Isle City.

Mr. J. B. Vanderveer reports a shark, very likely this species, as having been taken in the Delaware River many years ago, about 1848. It was taken at Fisher's Point (Fish House now, or its vicinity, and in Camden county) and brought to Trenton, and there kept on exhibition in the flesh some time after. It was said to have measured eight feet seven inches in length.

Dr. R. J. Phillips reported a large shark, evidently this species, and about seven feet long, taken at Corson's Inlet, in Cape May county, on August 10th, 1908. When opened it was said to contain a sea robin (*Prionotus*) and five spots (*Leiostomus*).

Family SPHYRNIDÆ.

Sphyrna zygæna (Linnæus).

Hammer Head Shark.

Dr. Phillips says he saw a hammer head about eighteen inches long, at Corson's Inlet, early in August of 1908.

Family RAJIDÆ.

Raja eglanteria Lacépède.

Common Speckled Skate.

Skates, evidently this species, as they are said to be of small size with pointed snouts, were reported by Dr. Phillips to be common at Corson's Inlet. A small and partly-digested skate was once found in the stomach of a red drum (*Sciænops*) when opened.

Raja lævis Mitchill.

Barn Door Skate.

Dr. Abbott tells me that the skate he reported in 1868 under this name was taken in the Delaware, somewhere in the vicinity of Beverly, in Burlington county, and was later exhibited in Trenton.

Family DASYATIDÆ.

Dasyatis centroura (Mitchill).

Sting Ray.

Two examples, most likely this species, were reported taken at Corson's Inlet during the past summer, according to Dr. Phillips.

Family ACIPENSERIDÆ.

Acipenser sturio Linnæus.

Sturgeon.

In Raccoon Creek, at Bridgeport, Gloucester county, reported scarce by the fishermen, and but few taken now.

Mr. H. Walker Hand reports that the fishermen were meeting with much better success off Green Creek, Cape May county, than for several years past, during late spring in 1908. At Dias Creek one of the fishermen caught two large roe sturgeon, seven black drums and five hundred pounds of weakfish on April 27th, it being the first lift of the pound-nets for the spring.

I saw two large examples taken at Pennsgrove, Salem county, in the Delaware, on July 22d, 1908.

Mr. J. B. Vanderveer says the sturgeon ascends the Delaware River at Trenton in the spring when the water begins to warm, after the breaking up of the ice. They move up in small-sized schools or bunches of a dozen or more on the new moon, afterwards dropping back. The buck is smaller than the sow, which weighs from fifty to

one hundred and twenty pounds. They deposit in the rapids on gravel bars, and at times the sexes are rather polyandrous, as many as a dozen males accompanying a single female. On one such occasion the anxious bucks were seen swimming nervously about and around an indisposed sow. As she did not seem to accept their attentions, some were seen to move off and then swim rapidly at her, striking their noses, one or more at a time, against her sides, so that the ova were literally forced out. At the same time the milt was expelled and the ova fertilized *en masse*. Sturgeon seldom jump when ascending the river, as they are then vigorous, and seemingly have the requisite amount of air. But after spawning their condition is weakened, appearing lazy, or often as over-sleepy, or becoming feverish, lying around on the bottom, and it is then that they frequently jump for air. Of many individuals opened, none were ever found to contain any food, unless it may have been invisible to the naked eye or microscopic. Formerly sturgeon fishing was carried on by spearing—that is, before nets were used. This was accomplished either at night with a light or during the day. The sturgeon could usually be readily located, as when dropping down stream they all move down tail first with the current, though the instant their tails would strike anything, such as a rock or log, they would immediately start up stream again, thus leaving a wake most always discernable at the surface. It was by means of this wake that the fish were located. They would then repeat their downward course until again feeling an obstruction. The fishermen believed that this method of descending tail first was to avoid the contact of the rocks and the snout, the latter being somewhat sensitive and capable of being easily bruised. The harpoon or barb was sometimes thrown free, or fastened to a rope, the latter method, of course, necessitating careful management in a boat, as a large sturgeon could tow it at good speed. The exhausted fish were finally hooked into the boat.

Acipenser brevirostrum Le Sueur.

Mouche.

According to the fishermen at Bridgeport, in lower Raccoon Creek, Gloucester county, the "mouche" is said to be very scarce. They distinguish it chiefly by its small size, which is said not to exceed three feet.

Mr. J. B. Vanderveer says this fish seems to be well known to the Delaware River fishermen, who claim it differs from the common sturgeon in having full-developed milt and ova when twelve inches long; that it seldom or never reaches over three feet in length; is mostly transparent when held to the light, while the common sturgeon is solid and not at all transparent; that the bony dorsal bucklers appear to differ, and that its snout is always blunt, even when small, while that of the common sturgeon is sharp when young, though blunt only with age. The flesh is very highly prized about Trenton, and the fish was known locally as the "Delaware salmon." Fishermen say that this species makes but a single run in the spring, and that on one moon, generally the full moon in April or late March. This fish is mostly called the mouche to distinguish it from the common sturgeon.

Family CLUPEIDÆ.

Pomolobus mediocris (Mitchill).

Hickory Shad.

Reported by fishermen to Dr. Phillips as occurring at Corson's Inlet.

Pomolobus pseudoharengus (Wilson).

Alewife.

In Raccoon Creek, at Bridgeport, Gloucester county, the "moon eye" is said by the fishermen to arrive late in May with the next. Many have been taken in the creek at times and they are valued as food.

Mr. Emlen Martin says they run in the Rancocas Creek as far as Hainesport, Burlington county. They arrive later than the shad, or about the middle of May.

Mr. J. B. Vanderveer, of Trenton, says that the alewife still ascends the Delaware in the spring in great numbers, and formerly in countless thousands, being the object of extensive fisheries for many years. They are the first herring to appear, and come with the shad, or a little later. They appear usually in April, fully four weeks in most seasons before the "black belly," though some have been taken as early as February. Though the fishermen admit that their ascension is

largely due to the spawning instinct, yet they argue that the food supply ever plays the dominant part in their habits. What this food they speak of is, is not clear, but may perhaps be microscopic plant or animal life contained in the water, as all the shad and herring ascending in the spring, and many hundreds have been examined, are found apparently empty. However, as they think it moves about in large areas in the water, either deep or at the surface, and is variously influenced by the tides, winds and rains, so the fish seem to act in accordance. They always seem to follow this so-called food, pushing ahead or falling back as it moves. The alewife moves up the river in schools of varying size, sometimes, as formerly, in immense numbers. If weather conditions are unfavorable, such as protracted cold, they run in the creeks where warmer water forming shallower places affords them comfort. The fishermen do not believe they spawn to any extent in these places, unless land-locked or obstructed in some manner. They select places, similar to those used by the shad, when depositing, and in this respect resemble them very much. They usually find a deep place, frequently of several feet, and always where the water has a whirling or rotating motion or current, as about deep eddies near the rocks in the river. Such places usually have clear or clean bottoms, but if not and such a locality is preferred, the fish will clean them by brushing them with their tails until only the bare stones or rocks are left. The fish assemble in schools in these places, moving restlessly about together. The ova and milt are deposited at the same time, the whirling water serving to thoroughly mix it as it sinks to the bottom on the rocks, especially in pebbles or stones in eddies. The fish never deposit in mud. Sometimes the spawn may be entirely destroyed by protracted foul or muddy water, freshets, floods, or similar causes. Like the sturgeon, when ascending, the alewife is vigorous and active, and appears to require little air from the surface, as they seldom jump. After depositing and when slipping down stream on their return to the sea, they may frequently be observed to jump. This jump is spoken of by the fishermen as the "rattle," which has earned for them the local name of "rattler." Indeed, it is claimed, so different are the sounds produced by this fish, from those of the black belly, that they have each earned their vernaculars from the fishermen by these peculiar habits when rising to the surface for air. The spent alewife ascends to the surface of the water abruptly, producing a more solid sort of splash, and when descending the tail is thrown up so that from

the laterally vibrated strokes near the surface a kind of rippling or rattling splash is produced. Sometimes over a large area hundreds will be found rattling, every few rods a wake appearing at the surface, and again a dozen may jump at once. As the herring gradually develop from the fry and reach a somewhat advanced adolescent stage, the condition of taking food appears to be different. This is thought probably due to the undeveloped branchial apparatus, it not yet having formed a fully-developed sieve to capture the food taken by the adult. It is at this stage that they will devour most any aquatic insect or small invertebrate, and only then may they be lured by the angler with his fly. Passing on down the river and reaching the sea they develop gradually the adult conditions and finally live in the ocean. The prevalent theory of the fishermen seems to be that the fish follow the current of the Delaware basin out into the Gulf Stream, where they may obtain suitable food. They also think that there is probably more southern migration, and that in the following spring the ascending herring enter the bays and rivers as the suitable food lures them on. This herring is variously called by the fishermen alewife, alewi, bulger or rattler.

Although I have not taken them myself, they have been taken on Burlington Island in the Delaware and have been reported to run in the small guts sometimes in the spring.

Pomolobus æstivalis (Mitchill).

Black Bellied Herring.

The "black back" is sometimes numerous in Raccoon Creek, at Bridgeport, Gloucester county, according to the fishermen. It is valued as food.

Mr. J. B. Vanderveer, of Trenton, says that this fish is distinguished by the fishermen of the Delaware River chiefly by the black peritoneum and its more slender form. It ascends the river much later than the alewife, appearing usually about three weeks afterward, sometimes four, or near the middle of or late in May, according, of course, to conditions. At least it is always conspicuously later. It appears sometimes in considerable numbers, though it does not seem to be quite so abundant on the whole as the alewife. When ascending it is like the alewife, vigorous and apparently without need of

ascending to the surface of the water, for it seldom, if ever, rises there unless possibly for food. It differs from both the alewife and shad in selecting shoal water to deposit, though never running in the creeks or small streams. They select shoals of clean gravel, often in the current, and there deposit their eggs. Like the alewife, the ova and milt are deposited at once, and all fertilized together as they sink to the bottom. They never deposit in mud. Sometimes quite large schools are found about the spawning-grounds. When spent and thus weakened they frequently rise to the surface of the water for air in their downward course in the river to the sea. They differ in their movements at the surface from the alewife at this time, and are said to "flip" by the fishermen, the name having been suggested doubtless by the noise or sound produced. They will ascend to the surface for air and suddenly turn, and in the downward course the impetus of the tail at the surface produces a single sharp slapping sound called the "flip." Hence the fishermen call them flippers. Like shad and alewives, nothing has been found in the stomachs of the many examples examined, except, possibly microscopic animal life not seen by the naked eye. Later, as they develop near the adult condition, though with imperfect branchial apparatus, they feed like the alewife and may then also be taken on a fly. Called rail herrin, black belly or flipper locally by the fishermen.

Alosa sapidissima (Wilson).

Shad.

A curious hermaphrodite of this species, in which milt and roe were about equally developed, was taken in the Delaware during late March of 1908 and brought to Camden. The organs are of the usual type of the milt and roe, only the anterior portion of each is characteristic of the milt alone, the posterior being the roe. This example was secured by Mr. J. B. Fine.

A number were reported to have been taken during spring runs in the tidewater of Raccoon Creek, at Bridgeport, Gloucester county. They are thought to be much less abundant than formerly, the fishermen thinking the polluted river water has acted as a greater check to their abundance in the river than any other cause.

Mr. Emlen Martin says that in the catches, which numbered about

thirty to fifty individuals during the season of 1908, most all were bucks, but one or two roes having been taken, in the Rancocas Creek, at Centerton. The largest seldom were over eight pounds.

Mr. J. B. Vanderveer, of Trenton, says that this well-known food-fish, the most important in this respect of all our river fishes, our fishermen believe to be far less common than formerly, when the extensive fisheries netted unusual catches. Unlike the herrings, the shad is said to produce no disturbance at the surface of the water when taking air. It ascends the river in the spring, as soon as the water warms sufficiently, and is at that time vigorous, and seemingly in its upward course seldom or never ascends to the surface of the water for air. Shad select such places as the alewife use, and spawn in a similar manner. They differ from both of our herrings, however, in that during their descent or return to the sea they never make any disturbance when rising to the surface for air. Fishermen think this is due to the shape of the nose being more produced. As the fry develop they soon reach a half-grown size, when they will devour most all kinds of insects and small aquatic animals, and at this season may be taken on a fly. When ascending the river, as on one occasion at the Delaware River bridge, at Trenton, the shadow of this seemed to form an impassable barrier. To one looking down from above large schools could all be seen herded all along the edge of the dark shadow, but not a single individual for an instant passing into it. Finally a leader among the fish appeared, and after swimming along the shadow several times finally determined on a point to pass through, when the whole multitude placidly followed in a narrow stream. The young are capable of caring for themselves after about three moons, and are eagerly devoured by chub, rock, perch, cat fish, etc.

Dr. R. J. Phillips has seen it at Gloucester.

Reported to have been taken in the Delaware at Burlington Island.

At Newbold's Island, Burlington county, many bright, silvery young were found on August 13th, 1908. They were about two inches long. After being in alcohol a short time their backs were brilliant emerald-green in some lights, with a bright violet streak back from upper eye edge to caudal base above. They were associated mostly in schools of moderate size, though were often taken with the other small fishes.

Brevoortia tyrannus (Latrobe).

Mossbunker.

Color, when fresh, of a young example, deep steel-plumbeous to slaty, blackish or neutral-blackish on back. Line of demarcation from about level with upper margin of eye to about middle of base of upper caudal lobe rather distinct, and all about with pale tints or nebulæ of pale indigo. Rest of side and entire lower surface, inclusive of lower surface of head also, and iris, bright silvery to mercury-white. Upper surface of head becoming pale and translucent grayish on snout and front of mandible. All this region also finely dotted with dusky. Dorsal and caudal pale translucent grayish, finely dotted with darker. Other fins pale translucent whitish. Length $2\,^{9}/_{16}$ inches. A single example taken at Corson's Inlet on January 14th, 1908, in a hauling-seine. W. J. Fox and D. McCadden.

Menhaden were so abundant in the latter part of August, 1908, that they ran in Tuckerton Creek and the tributaries of Little Egg Harbor and Tuckerton Bay, so that large numbers were captured for fertilizers. This was thought to be due to the blue fish forays, the latter also running in in numbers, some being taken inside. J. A. G. Rehn.

Family DOROSOMATIDÆ.

Dorosoma cepedianum (Le Sueur).

Gizzard Shad.

Several mud shad were taken in Raccoon Creek, near Bridgeport, Gloucester county, according to the fishermen, in March of 1908. They are not valued in any way.

Mr. J. B. Vanderveer, of Trenton, says they occur mostly in muddy ponds and in some instances have been taken in such places by the boat-load. Though of no use as a food-fish, they have been sold as "bitter heads" or "poor soles," as low-grade fish. They are not a very hardy species, and resort to the mud in cold weather, where they stay all winter. They feed on the ends of decayed channel grass or candocks in winter. In warm weather they take their prey at the surface of the water like a small rock, and will then also take a hook

baited with a worm. They will also take small fish. They deposit, unlike their relatives, in the mud. The female is much larger and more chunky than the male. Called gizzard shad, gizzard fish and mud shad by the river fishermen.

Reported to have been taken in the Delaware at Burlington Island.

Family ENGRAULIDIDÆ.

Anchovia brownii (Gmelin).

Broad Banded Anchovy.

Dr. R. J. Phillips reports anchovies about three inches long which were rather abundant at Corson's Inlet this past summer. They were taken for bait by the fishermen, who knew them as "pink white bait."

Family ARGENTINIDÆ.

Osmerus mordax (Mitchill).

Smelt.

A number were taken in the Delaware River at Trenton in early April of 1908, according to Mr. Vanderveer. He says they are taken by hook and line fishermen in late spring and early summer, mostly in May and till the middle of June. They run in the little inlets later, but do not leave the tidewater, and are often seen in some numbers about the sewer outlets. They bed in deep water in muddy bottoms, in winter.

Family ANGUILLIDÆ.

Anguilla chrisypa Rafinesque.

Eel.

Found in Repaupo Creek, near Repaupo, in the Delaware basin of Gloucester county, April 19th, 1908.

Reported abundant in Raccoon Creek at Bridgeport, Gloucester county. One seen about thirty inches long on April 19th, 1908.

Transparent young found in Sluice Creek, a tributary of Dennis Creek, above the "beaver dam," Cape May county, on May 10th, 1908. Fishermen reported that quite large ones are taken at times.

Several small or half-grown ones were found about the more muddy places and under stones on Newbold's Island, Burlington county, on August 13th, 1908.

Dr. Phillips found it at Corson's Inlet, reaching about two and one-half feet.

Found on Burlington Island in June of 1902.

Family LEPTOCEPHALIDÆ.

Leptocephalus conger (Linnæus).

Conger Eel.

According to Dr. Phillips, the fishermen report it as occurring off Corson's Inlet.

Family CYPRINIDÆ.

Hybognathus nuchalis regius (Girard).

Silvery Minnow.

Abundant in the Delaware River, near Florence, Burlington county, on July 11th, 1908. They were mostly small, and not associated with other fishes, swimming in rather large schools just a little off shore.

This was abundant in the Delaware River, at Newbold's Island, Burlington county, on August 13th, 1908. They occurred in some places in small schools, appearing not to associate very much with the other fishes, and usually were found about the clearer, clean, sandy shallows or shores. One very large or adult example was secured, and all exhibited the usual silvery-white coloration, none being brassy.

I have found this species several times in the Delaware, about Burlington Island.

Semotilus bullaris Rafinesque.

Chub.

Color when fresh with back and upper surface of head, deep steel-blue, greenish reflections seen in certain lights. Edges of scales at pockets, with deep neutral-black tints forming continuous reticulated pattern till well down middle of sides. Under surface of body opaque silvery-white. Sides of head with a brilliant deep rosy-red or vermilion tinge, fading paler and whitish below. Entire side of body with deep rosy-red tinge, intense in life. Snout olivaceous-brown. Cheeks intense scarlet. Iris bright orange, with narrow ring around slaty pupil lighter and apparently better defined. A dark neutral streak around origin of squamous area on post-occipital and nuchal region. Dorsal olivaceous, with warm orange tints, and becoming bright vermilion at base of fin. Caudal ochraceous-olive, radii around outer portions more neutral tint. Shoulder girdle with bright orange-vermilion tinge. Pectoral brilliant orange-vermilion, deepest inside, and upper margin narrowly dusky. Ventral paler, orange-vermilion medianly, without dusky. Anal pale orange medianly, with whitish around margins. Length eleven and one-half inches. This example was taken in the Delaware, at Trenton, April 4th, 1908, and forwarded to me by Mr. J. B. Vanderveer and Dr. C. C. Abbott. I was very glad to have this opportunity of examining this fish in high coloration. Though no tubercles were present on the upper surface of the head, I have seen adult breeding-males which were so furnished. These large chubs are taken with the suckers, and as they will all live some time in captivity, find a ready sale among the Jewish population. Dr. Abbott first described this species from our limits many years ago.[1] Very shortly after his elucidation, and the application of the name *Cyprinus corporalis* Mitchill to it, a step which has since, to a great extent, been thought justified by later writers, Cope set aside and renamed the fish *Leucosomus rhotheus*,[2] besides rejecting Rafinesque's generic name *Semotilus*. Cope is also credited with having stated that there were apparent inaccuracies in Dr. Abbott's description of color, and without living specimens a correction could not be made, but its general appearance when drawn from the water,

[1] Proc. Acad. Nat. Sci. Phila., 1861, p. 154.
[2] L. C., p. 523.

as far as recollected, was silvery, without spots or bands. These remarks are hardly justified at all by my own observations, as Dr. Abbott's fish was a fully-developed breeding-male. These are most certainly as gorgeously attired as described by himself long ago and in my notes above. At other times of the year the chub, it is true, is silvery, but more especially when young. The spots and bands referred to are to some extent evanescent, diffuse or variable, and sometimes appear more intense than at others, though never much more than obsolete tints at best. Mr. Vanderveer says that the chub often feeds on the little bits of vegetation which sometimes float to the surface, after a school of suckers have been browsing about and dragging the plants from the bottom. At such times it would be comparatively easy to locate them by the disturbance at the surface of the water, when they were readily captured.

Occasionally taken in the tidewater of Raccoon Creek, near Bridgeport, Gloucester county, during warm weather. They are said to reach but a moderate size and are not especially valued.

Mr. Vanderveer says that in the Delaware near Trenton in winter and spring, sometimes browsing suckers will disturb the channel grass by pushing about among it and thus little decayed ends will float to the surface. These ends will then form a tempting lure to the chub, and the little disturbance at the water's surface indicating to the fishermen the condition below so that a profitable haul may be made. Sometimes both chubs and suckers were taken in this way. The tail of the chub produces but a little wake as he swims near the surface. Chubs are cannibals, eating their own kind, fish-spawn, and insects. The latter they always take with a break at the surface. They grow rapidly in warm weather, or till the water cools. In winter they lurk about deep holes with hard bottoms. They readily take dough-bait. In size they reach a weight of about two and one-half to three pounds and a maximum length of about twenty inches.

Abramis crysoleucas (Mitchill).

Roach.

Young very abundant in large schools associated with *Notropis chalybæus* in Still Run, near Porchtown, this one of the head-waters of the Maurice River in Gloucester county. They were not so darkly-

colored as usual in cedar-stained streams, and were only found in sheltered quiet places along shore April 17th, 1908.

Reported to be frequently taken in Sluice Creek, tributary of Dennis Creek, in Cape May county.

About Trenton Mr. J. B. Vanderveer finds the roach more of a creek or pond fish, and, when found in the river, usually about channel grass. He found it reached a length of about seven inches.

Abundant in the lower tidal of the Assiscunk Creek, near Burlington, on September 15th, 1908. An adult about five inches long had very pale yellow lower fins. The young very abundant in all the still muddy shallows, swimming rather slowly about in scattered schools. Disturbing or making the water muddy did not appear to especially inconvenience them.

Small examples taken on Burlington Island in June of 1902, and larger ones seen later.

Notropis bifrenatus (Cope).

Bridled Minnow.

An unusually yellowish example was seined in the Delaware River near Florence, Burlington county, on July 11th, 1908.

Found on Burlington Island by me.

Notropis hudsonius amarus (Girard).

Spot Tailed Minnow.

In the Delaware River at Newbold's Island, Burlington county, this was the least abundant cyprinoid on August 13th, 1908. It associated with and frequented to some extent the same places as the silver fin. The fry and small examples were most numerous, but few adults having been secured. The caudal spot, though evident, was not very vivid.

I have taken this fish in the Delaware at Burlington Island.

Notropis whipplii analostanus (Girard).

Silver Fin.

This was the most abundant cyprinoid in the Delaware along the shores of Newbold's Island, Burlington county, on August 13th, 1908. Many young were found in some places, as along the clear, sandy banks, in veritable hosts. The beautiful adults, some of which were males, were interesting, as they had entirely lost the breeding-tubercles and satin-white fin-pigment. Their scales, however, exhibited the beautiful reticulated diamonds in the usual pattern, and the posterior dorsal membranes were marked distinctly with the characteristic black dorsal blotch.

Abundant in the lower tidal of the Assiscunk Creek, near Burlington, on September 15th, 1908. They frequented the shallows, but all seen were young or small in size. They preferred the muddy shoals with the retreating tide, and were seldom found associated with the other small fishes. When disturbed in these places they had a curious habit of skipping or jumping out of the water in their efforts to get away quickly. They would frequently jump several inches in the air and skip a distance of from a few inches to a foot, in this greatly suggesting mullets (*Mugil*) as they jump a cork-line of a seine. They would all then be enabled to reach deep water and so escape. We did not notice the killies do this.

Found by me in the Delaware at Burlington Island.

Notropis chalybæus (Cope).

Blue Green Minnow.

Very abundant in Still Run, near Porchtown, upper basin of the Maurice River, in Gloucester county, April 17th, 1908. They were without breeding-dress, lacking tubercles or orange pigment. Both this and *Abramis crysoleucas,* with which they were associated, were preyed on by the pike which were constantly darting into the schools, seizing a victim and as quickly returning to their original point of vantage. None of the minnows were of the dark cedar-stained type found in other lowland streams. Small or young examples were numerous.

Cyprinus carpio Linnæus.

Carp.

Abundant about Bridgeport in Raccoon Creek, Gloucester county. Raised in carp ponds for market.

Family CATOSTOMIDÆ.

Erimyzon sucetta oblongus (Mitchill).

Chub Sucker.

One small example taken in a school of minnows in Still Run, one of the headwaters of the Maurice River near Porchtown, Gloucester county, on April 17th, 1908.

Reported common, and usually found in summer by the fishermen at Bridgeport, in Raccoon Creek, Gloucester county.

Reported in the ditches or runs on Burlington Island.

Catostomus commersonnii (Lacépède).

White Sucker.

Taken in the Delaware River at Trenton early in April of 1904 with the chub and smelt. They are sold to the Jews, according to Mr. J. B. Vanderveer. The river fishermen distinguish several kinds. The sand sucker is described as mostly dull yellowish, and this color encircling most all the body except a narrow whitish median ventral or abdominal stripe. It is said to be rather shorter, more plump and not much in meadows. They travel alone, all moving up about one time and on one moon. Other suckers, called creek sucker, black sucker and gravel sucker, may possibly refer to some other species. Some are said to have the dorsal scale pockets blackish, the belly white, and the body more slender. They weigh up to four and one-half pounds, with about fifty individuals to 200 pounds.

Reported to be common in Raccoon Creek at Bridgeport, Gloucester county, in the spring.

Reported to occur on Burlington Island.

Family SILURIDÆ.

Felichthys marinus (Mitchill).

Sea Cat Fish.

Color, when fresh, beautiful steel blue-black on back or upper surface, fading brilliant mercury-white on sides and lower surface. A bluish sheen extending down whole length of sides. Under surface of body shining milky-white. Dorsal and caudal dusky, latter darker towards edges. Pectoral dusky above, below and inner edges dull whitish. Ventral and anal dull whitish, latter antero-medianly pale dusky. Maxillary barbel silver-gray, otherwise distally whitish. Lower mental barbels whitish. Edge of upper jaw gray-white. Mandible whitish. Iris silvery. Adipose fin dusky. Length thirteen inches. Sea Isle City. W. J. Fox. August 20th, 1908.

Ameiurus catus (Linnæus).

White Cat Fish.

In Raccoon Creek, at Bridgeport, Gloucester county, the white cat is reported to appear early in June, when but few are taken.

Mr. Emlen Martin secured two examples in the Rancocas Creek, at Centerton, Burlington county, in August, on live minnow bait. He also says that a number were taken during the spring, but that they are less abundant than the yellow cat. Some attained five or six pounds in weight.

Said to run in Sluice Creek, tributary of Dennis Creek, in Cape May county, to the beaver dam, but not taken above, according to the fishermen.

A young example was taken in the Delaware River, at Newbold's Island, Burlington county, on August 13th, 1908. It was a pale livid slaty-gray in color.

Mr. J. B. Vanderveer says two forms of forked tail cat fish occur in the Delaware, and differ chiefly in the eye and coloration. The large white cat fish is said to deposit only when a foot or more in length, while the "bullhead," or the smaller form, is said to deposit when

but four inches. Formerly the large white cat was very abundant, appearing in late May or early June, according to the weather, and on either side of the river, as a long continuous procession, narrow, but of great length. During their ascension they would frequently flip like the black belly herring, though the very large ones usually appeared to move up singly and seldom or never flip. The frequency of their flipping very often determined the extent of the procession, for if rather narrow the flipping was comparatively less than when the procession was wide. These processions would push away beyond tidewater into the upper basin of the Delaware for many miles, their object seemingly to feed on the numerous small snails which swarmed in those regions. As this source of food seemed to decrease or disappear, the cat fish gradually descended the river, so that they would again reach Trenton by about July. As the snails grew, or at least seemed to be more numerous, the advent of the cat fish was more marked, the fish afterwards gradually disappearing. Sometimes two or three runs would be noted in June, when the ascension occurred, and on one occasion many years ago seven wagonloads were taken in a single haul. The fishermen think the "bullhead" never occurs in strings, but appears scattered, both when ascending and descending, and it is only found when baited. The "silver tail" moves off the first full moon in August. Bullheads reach about one to three or four pounds in weight, and though considered better in the Susquehanna, the "silver tail" is the better fish in the Delaware.

Reported to occur in the Delaware at Burlington Island.

Ameiurus nebulosus (Le Sueur).

Yellow Cat.

This species is reported to be common in Raccoon Creek at Bridgeport, Gloucester county. A number, each weighing about a pound, were seen April 19th, 1908.

Mr. Emlen Martin says it is common in the Rancocas Creek at Centerton, Burlington county.

Reported common in Sluice Creek, tributary of Dennis Creek, in Cape May county.

Mr. J. B. Vanderveer says they deposit in the Delaware in June,

and run in the creeks and ponds, where they care for their young. In the late summer they move out into the channel grass in the larger streams to feed on snails, sometimes as late as September. At times twenty to one hundred pounds have been netted in a single "set." Called yellow cat or nigger cat fish by the fishermen.

Found by me on Burlington Island.

Family ESOCIDÆ.

Esox americanus (Gmelin).

Ditch Pike.

I have found this on Burlington Island.

Esox reticulatus Le Sueur.

Pickerel.

Abundant in the mill pond at Franklinville, Gloucester county, basin of Little Ease Run, headwaters of the Maurice River, April 17th, 1908.

Very abundant, though most all seen were small, in the headwaters of the Maurice River called Still Run, near Porchtown, Gloucester county, on April 17th, 1908.

A small example seen at the head of the lake at Millville, Maurice River, in Cumberland county, May 9th, 1908.

Several young about two inches long or less were taken in Sluice Creek, above the dam, tributary of Dennis Creek, in Cape May county. Said to occur in the lake, of rather large size, and the only species.

Dr. R. J. Phillips has taken it at Palatine and Clayton.

Family UMBRIDÆ.

Umbra pygmæa (De Kay).

Mud Minnow.

Several small examples taken in Crooked Creek at Cape May Court House, Cape May county, January 5th, 1908.

Several large dark examples taken in Great Sound Creek, Cape May county, January 5th, 1908.

A small dark example was found in a quiet muddy pool near Porchtown, basin of Still Run, headwaters of the Maurice River in Gloucester county, on April 17th, 1908. It was associated with a number of small tadpoles.

Several dark examples, one quite large, taken in Repaupo Creek of the Delaware basin, in Gloucester county, April 19th, 1908, near Repaupo.

Several taken in the clear cedar water of Little Timber Creek where it flows through a cedar swamp near Coopers, Gloucester county, April 19th, 1908.

In a little choked-up brook tributary to the lake at Millville, Maurice River basin, Cumberland county, they are abundant, though of small size. All were rather dark, though less so than those taken in the first branch of the lake at its head and in the black water among the cedars. These latter fish were dusky-black with very dark bellies. May 9th, 1908.

Several in a sphaguum bog along Sluice Creek, tributary of Dennis Creek, in Cape May county, on May 10th, 1908. Small in size and variably deep blackish in color.

Found by me on Burlington Island.

Family PŒCILIIDÆ.

Fundulus majalis (Walbaum).

May Fish.

Dr. R. J. Phillips says it is common at Corson's Inlet, and the female is distinguished as of that sex by some fishermen.

Locally abundant in the surf at Ocean City on September 10th, 1908. The numerous adult females were usually more abundant than the males. Some of the latter were in high coloration, head blackish and anal long, etc.

Fundulus heteroclitus macrolepidotus (Walbaum).

Mummichog.

Abundant in Crooked Creek, Cape May county, on January 5th, 1908.

Abundant in Great Sound Creek, Cape May county, on January 5th, 1908.

At Newbold's Island, in the Delaware River, Burlington county, it was quite abundant along the shallows of the shore on August 13th, 1908, though less so than *Fundulus diaphanus*. No large ones were found, and though both sexes were distinct in their coloration, they were of the *ornatus* type. The males thus lacked the extreme dark color with sulphur-yellow variegations, and the females were a little speckled.

Dr. Phillips says the "bullhead" is common at Corson's Inlet.

Small or young very abundant in the lower tidal of the Assiscunk Creek, near Burlington, on September 15th, 1908. They were usually associated with the next.

Very abundant on Burlington Island.

Fundulus diaphanus (Le Sueur).

Barred Killifish.

Small example taken in the upper waters of Crooked Creek, near Cape May Court House, Cape May county, January 5th, 1908.

Abundant in the Delaware River, near Florence, Burlington county, on July 11th, 1908. Many were males, and some large females were also seen, though the former had lost some of their brilliancy.

The most abundant fish met with along the shores of Newbold's Island, Burlington county, in the Delaware River, on August 13th, 1908. Some were quite large or full-sized adults, and quite larger than the last species. These very large examples were dull sandy-brown, with dull vertical bars. Medium-sized individuals, males with faded breeding-dress, were rather common. Some others were quite small, though they all retained but faint traces of their former brilliant yellowish and azure tints. The young were very common.

Very abundant, and reaching a larger size than the preceding, in the lower tidal of the Assiscunk Creek, near Burlington, on September 15th, 1908.

Very abundant on Burlington Island.

Family BELONIDÆ.

Tylosurus marinus (Walbaum).

Green Gar.

One small example found in the Delaware River, near Florence, Burlington county, on July 11th, 1908. Others of larger size were seen.

In the Delaware River, at Newbold's Island, Burlington county, on August 13th, 1908, several small ones were taken, and some large ones about a foot in length were seen. They were probably more frequently captured than we supposed, but were easily enabled to slip through the meshes of the net on account of their slender bodies, and thus disappear before being observed as the net was hauled ashore.

Mr. J. B. Vanderveer says the bill fish is rather rare in the Delaware, appearing sometimes in a small school of about a dozen, though

usually two or three individuals are seen at one time. It appears in June and July, till August, and reaches a length of from one and one-half to two feet.

Dr. R. J. Phillips says it is common in the bait-nets at Corson's Inlet this year. It reaches a maximum size of about eighteen inches.

Found by me in the Delaware about Burlington Island.

Family HEMIRAMPHIDÆ.

Hyporhamphus unifasciatus (Ranzani).

Half Beak.

Dr. R. J. Phillips reports about a dozen taken at Corson's Inlet in a bait-net during the past summer.

Family ATHERINIDÆ.

Menidia menidia notata (Mitchill).

White Bait. Silversides.

Color when fresh pale and very translucent sandy-gray or brown, edge of each scale on back with dark margins formed of dusky dots. A narrow silvery lateral streak from axilla to base of caudal, sharply defined from back by a narrow streak of plumbeous on its upper edge along entire course. This silvery streak of intense mercury-like appearance its whole length. Muzzle translucent brownish, and inclusive of mandible and preorbital finely dotted with dusky. Iris bright silvery-white. Upper surface of head translucent sandy-gray like rest of body, and also finely dotted with dusky rather inconspicuously. Cheeks, opercle and side of head with bright silvery, reflected pale bluish and purplish in some lights. Inside of gill-opening silvery-gray, finely dotted with dusky. Fins all pale translucent grayish-white. Peritoneum showing through body-walls of abdomen bright silvery. Length four and three-eighths inches. Also, five others from Corson's Inlet on January 14th, 1908. At the above locality this fish is seined as a food-fish, and is known as "white bait." The smaller examples are shipped to the Philadelphia markets *en masse,* and I have

seen large pans or boxes, each containing many thousands of individuals, exposed there for sale. At Corson's Inlet they were cooked or boiled in grease, and when thus served are said to be very palatable, if not boiled too much. They seem to keep well when frozen, like smelts, and are thus readily transported. They appeared to be equally abundant at this season as they are during warm weather and along other points of the seashore.

Dr. Phillips says it was common during the past summer in the bait-net at Corson's Inlet, was used as food, and known as "white bait" by the fishermen.

Several taken in the surf at Ocean City on September 10th, 1908, with the sand lance. They soon die out of water. Some were quite large in size and rather duller silvery than usual.

Taken at Grassy Sound July 18th, 1904.

Family MUGILIDÆ.

Mugil curema Valenciennes.

Mullet.

Dr. Phillips says that the small mullets, evidently this species, are used as bait for rock at Corson's Inlet. The large ones in the fall are called "fat backs."

Several taken in the surf at Ocean City on September 10th, 1908. They were about six inches long, and had the golden opercular blotch quite prominent. None attempted to jump the cork lines of the seine as it was hauled ashore, as they so often do in still water.

Family GASTEROSTEIDÆ.

Gasterosteus aculeatus Linnæus.

Two Spined Stickleback.

Color when fresh, deep slaty or neutral-blackish over the greater portion of the upper surface, fading into a steel slaty-gray on the sides, and also somewhat paler below. Dark color of the back spreads over at least upper half of body, and while more or less uniform on

back, is inconspicuously mottled on sides with a slightly darker shade than general body-color. This mottling takes the form more or less of specks of rather uneven size, distributed at least over all of the cuirass of the trunk. Along base of anal the spots are distinct. Snout, edge of mandible and preorbital till level with lower margin of eye all dusky or slaty-blackish like rest of upper surface of head, though line of demarcation after eye not so distinct and not extending below upper basal margin of pectoral. Opercle and pre-pectoral plate pale like sides of trunk, and finely mottled with rather a few dusky specks. Sides of mandibular rami tinted a little with neutral-slaty. Iris neutral-slaty with a narrow silver circle around slaty-black pupil. Rest of under surface of head like thorax. From axil of ventral back to vent and just above pale pubic process a tract of neutral specks or dots extending back. In some lights entire lateral and lower surface of body has a brilliant shining and metallic appearance like dark burnished steel. Dorsal spines pale neutral, membranes transparent. Dorsal rays, anal and caudal translucent whitish, also pectoral. Ventral spine grayish-white, and membrane within closed fin brilliant orange. Length two and one-half inches for largest example. In all, fourteen examples from Corson's Inlet, Cape May county, on January 14th, 1908. They were taken in a hauling-net or seine by Mr. W. G. Carothers. They were not known to the fishermen. Most all show at least a little orange tinge in the ventral membranes. Shrimps were also very common at the same time.[1]

Apeltes quadracus (Mitchill).

Four Spined Stickleback.

Several adults, males with red ventrals, were taken in Great Sound Creek, Cape May county, on January 5th, 1908.

Found abundantly in grassy pools on Burlington Island in June of 1902.

[1] ***Crago septemspinosus.*** **Also an example of *Globiocephala brachyptera* Cope was captured there under the same date, the skeleton of which I have examined in the Academy.**

Family FISTULARIIDÆ.

Fistularia tabacaria Linnæus.

Trumpet Fish.

One was taken in a tide pool at Corson's Inlet this summer, according to Dr. R. J. Phillips. It was about eight inches long.

Family SYNGNATHIDÆ.

Syngnathus fuscus Storer.

Pipe Fish.

Mr. J. A. G. Rehn secured an example at the mouth of Westecunk Creek, in Ocean county, in salt water, on August 12th, 1908.

Dr. Phillips says several were taken at Corson's Inlet, and a small and large one preserved.

One hauled ashore in the sea lettuce at Ocean City on September 10th, 1908. It was very dark brown in color.

Family TRICHIURIDÆ.

Trichiurus lepturus Linnæus.

Cutlass Fish.

Reported at Sea Isle City as "silver eel" in late June of 1908. W. J. Fox.

Family CARANGIDÆ.

Seriola zonata (Mitchill).

Amber Fish. Pilot Fish.

One taken at Ocean City on August 15th, 1908, by Mr. D. McCadden.

Dr. Phillips reports two taken early last August in Corson's Inlet.

Selene vomer (Linnæus).

Moon Fish.

One at Sea Isle City late in August, 1908. W. J. Fox. They were then reported to be abundant there, and a number were shipped to market.

Dr. Phillips reports small ones taken in the bait-nets at Corson's Inlet.

Trachinotus carolinus (Linnæus).

Common Pampano.

A pampano, evidently this species, reported taken at Corson's Inlet on August 21st, 1908, by Dr. Phillips.

Several taken at Ocean City on September 10th, 1908, in the surf.

Family POMATOMIDÆ.

Pomatomus saltatrix (Linnæus).

Blue Fish.

Dr. Phillips says they are common some years at Corson's Inlet. Small ones abundant in August.

One small example taken at Ocean City on September 7th, 1908, by Mr. David McCadden, with an isopod crustacean on the gills.

Forty-three examples of moderately small size were taken, mostly in a single haul of the seine, in the surf at Ocean City, on September 10th, 1908. They were apparently all herded in a school in one of the gullies or little bays formed along the beach, and from which the tide was fast ebbing with a very strong undertow. All the fish opened contained half-grown sand lance, most of which appeared to have been swallowed whole. One blue fish, when thrown on the dry sand, vomited a small live sand lance. But a single blue fish was found infested with the familiar isopod crustacean attached to the gills. The teeth of the blue fish, even when small, are very sharp, and I was painfully bitten by one in its struggles as it floundered about.

The flesh is excellent eating at this age, being very tender, juicy, and of excellent flavor. About three or four are a very fair meal for one person.

Family STROMATEIDÆ.

Poronotus triacanthus (Peck).

Butter Fish.

Dr. Phillips reports having seen it at Somers Point and Atlantic City.

Family APHREDODERIDÆ.

Aphredoderus sayanus (Gilliams).

Pirate Perch.

A bright-colored nearly full-grown example taken in Repaupo Creek, Delaware basin, near Repaupo, in Gloucester county, on April 19th, 1908.

Family CENTRARCHIDÆ.

Pomoxis sparoides (Lacépède).

Calico Bass.

One small or young example several inches long was taken in a seine in the clear water on a sandy bank along the shore of Newbold's Island, Burlington county, on August 13th, 1908. In life it was dull muddy-brown with blackish specks.

Acantharchus pomotis (Baird).

Mud Sun Fish.

A rather large example was taken above the "beaver dam" of Sluice Creek, tributary of Dennis Creek, in Cape May county, on May 10th, 1908. Coloration of the usual olive.

Enneacanthus gloriosus (Holbrook).

Blue Spotted Sun Fish.

In a pool formed at the exhaust of the Pensauken water works several examples were found March 21st, 1908. No other fishes were seen. The pool is about twenty by forty feet in size, with about three or four feet depth, of warm water, and of such high temperature that the aquatic vegetation all along the banks was forced well beyond the other plants outside the area of the pool. Though suffering somewhat from the frosts, the forced plants were still growing. Constant clouds of vapor were steaming from the surface of the water, though the fish were of the usual activity when captured, and displayed the usual characteristics when found in midwinter. They all seemed to lurk in the vegetation along the banks.

An example nearly full grown, though not especially brilliant, was taken in Repaupo Creek, near Repaupo, Delaware basin, in Gloucester county, on April 19th, 1908.

Found in grassy pools on Burlington Island in June of 1902.

Lepomis auritus (Linnæus).

Long Eared Sun Fish.

Mr. J. B. Vanderveer says the river sun fish was more abundant about Trenton formerly, were taken with lines, and reached as much as three-quarters of a pound in weight.

Young abundant in the Delaware about Burlington Island.

Eupomotis gibbosus (Linnæus).

Common Sun Fish.

Said to be abundant in Raccoon Creek, at Bridgeport, Gloucester county.

Young taken in the grass of the lake above beaver dam of Sluice Creek, tributary to Dennis Creek, in Cape May county, May 10th, 1908.

In the Delaware River, at Newbold's Island, Burlington county, the young were common about the more grassy places, though all small and rather dull-colored, August 13th, 1908.

Mr. Vanderveer says this is very common in the Delaware, often in pools and creeks.

Common in the Delaware about Burlington Island.

Micropterus dolomieu Lacépède.

Small Mouthed Black Bass.

Introduced into Sluice Creek above the "beaver dam," basin of Dennis Creek, in Cape May county.

Family PERCIDÆ.

Perca flavescens (Mitchill).

Yellow Perch.

Fishermen reported a few to occur in Raccoon Creek, at Bridgeport, Gloucester county. One seen taken by a fisherman on April 19th, 1908.

Reported scarce in Sluice Creek, tributary of Dennis Creek, in Cape May county.

Mr. J. B. Vanderveer says it ascends the Delaware rather scattered in the spring or about several to a bunch, and these bunches moving close along shore. It ascends also the creeks and meadow streams, and deposits about Trenton.

Boleosoma nigrum olmstedi (Storer).

Tessellated Darter.

In the Delaware, at Newbold's Island, Burlington county, they were abundant about the mouth of the inlet on sandy bottoms. All were adults, but of a pale straw color, none in the dress of the breeding-male. August 13th, 1908.

Seen in shallow runs on Burlington Island.

Family SERRANIDÆ.

Roccus lineatus (Bloch).

Rock.

Reported frequently taken in Raccoon Creek, at Bridgeport, Gloucester county.

Reported to be taken rarely at Townsend's Inlet.

Young very abundant in most all localities seined at Newbold's Island, Burlington county, August 13th, 1908. All were small, and none over about three inches in length. The dark lateral stripes above the lateral line were very inconspicuous, and the dark vertical bands on the back were also somewhat obscure in the living fish. Usually all were rather dull olive above and whitish below.

Mr. J. B. Vanderveer says the rock spawns along a hard, sandy shore where the water is clear and surging, so that the eggs may be disturbed and lashed about in the sands. The young are very abundant in the late summer about Trenton in the Delaware.

Dr. R. J. Phillips says they are taken at Corson's Inlet up to forty-nine pounds. Examples, twenty-one, seventeen and twelve pounds were taken this year. Other years' examples, twenty and twenty-three pounds in weight were taken.

Young common about Burlington Island.

Morone americana (Mitchill).

White Perch. Perch.

Reported frequent in Raccoon Creek, at Bridgeport, Gloucester county.

About a hundred taken in an eel seine in Ludlam's Thoroughfare, Sea Isle City, during the middle of August, 1908.

Several young were taken in the Delaware River at Newbold's Island, Burlington county, on August 13th, 1908. The largest was several inches long. Color silvery as usual, and scarcely variegated.

Mr. Vanderveer says the white perch is not known to spawn about Trenton. They appear scattered, and then appear to locate in certain territories, seemingly to protect themselves, the large ones leading the

schools. Once fifty-one examples, weighing fifty pounds altogether, were taken in one haul.

Dr. Phillips has found it at Corson's Inlet.

Frequently found about Burlington Island.

Centropristes striatus (Linnæus).

Black Sea Bass.

Dr. R. J. Phillips has caught it at Ocean City, Grassy Sound, Corson's Inlet and South Atlantic City.

Family SPARIDÆ.

Stenotomus chrysops (Linnæus).

Porgy.

Dr. Phillips has taken it at Corson's Inlet and off Five Fathom Bank.

Lagodon rhomboides (Linnæus).

Sailor's Choice.

Dr. Phillips reports three taken at Corson's Inlet this year.

Archosargus probatocephalus (Walbaum).

Sheepshead.

Dr. Phillips reports that they are seen, and some caught, every year at Corson's Inlet. They come up to the top of the water on high tides at times to feed on the mussels along the pilings. On such occasions they have been known to be speared.

Family SCIÆNIDÆ.

Cynoscion regalis (Schneider).

Weak Fish.

Several were reported to have been taken in the Delaware River, at Pennsgrove, Salem county, during 1907. They were known locally as "trout," and where taken in gill nets. This is as far up the river as I am aware they have ever been found.

Mr. H. Walker Hand reports weak fish plentiful at Green Creek, Cape May county, by May 3d, 1908.

Dr. Phillips says they are not especially plentiful at Corson's Inlet. They are taken usually from one to two pounds, and occasionally larger ones come in.

Cynoscion nebulosus (Cuvier).

Spotted Weak Fish.

Dr. Phillips says that small ones were caught at Corson's Inlet, about 1905, during the night, in the bait-net. He saw a small lot taken about ten years ago at Cape May. They were brought in from off shore, and weighed about one-half pound each.

Bairdiella chrysura (Lacépède).

Silver Perch.

Dr. Phillips says that he first saw it at Corson's Inlet this year. Quite plentiful in the main channel, on the king fish grounds.

Sciænops ocellatus (Linnæus).

Red Drum.

Dr. Phillips says they are caught every year at Corson's Inlet, and are the principal game fish. They are taken down close to the surf line in the inlet. They are also taken by casting in the surf. They

feed head down and tail up, the caudal ocellus frequently visible, under the railroad bridge, where they have also been caught, one weighing forty pounds. They have been seen caught on the outer bar as high as fifty-six pounds, though he never saw smaller examples than about twenty pounds in weight. They are valued as a food-fish.

Leiostomus xanthurus Lacépède.

Cape May Goody.

A half-grown example was taken in the surf at Ocean City on September 10th, 1908.

Dr. Phillips says they are very plentiful some years at Corson's Inlet, and very scarce others. They are carnivorous, and great bait thieves. He has also taken them at Somers Point.

Menticirrhus saxatilis (Schneider).

King Fish.

Young were taken in several haulings of the seine in the sea lettuce, at Ocean City, on September 10th, 1908. They were beautifully variegated with deep brown blotches.

Dr. Phillips has taken them at Corson's Inlet and South Atlantic City. They have been plentiful the last three years, especially the past season, catches being about fifty to seventy-five per man on a tide. He caught fifty-eight on part of one tide this year. The young were also extremely abundant during 1905, and they were then the only fish taken in bait-nets. This and the sea bass are the principal fish for the summer excursionist.

Pogonias cromis (Linnæus).

Black Drum.

Dr. Phillips caught one last year, at Corson's Inlet, weighing fifty-eight pounds. Small banded examples of about twelve pounds were caught in surf-casting this year. Though the big fish are said to be inedible and poor eating, the large one he took last year was found to be very good. He thinks its flesh equals that of the red drum.

Family LABRIDÆ.

Tautogolabrus adspersus (Walbaum).

Bergall.

A fine example, seven and one-quarter inches long, taken at Ocean City on September 7th, 1908. Also two others on the same day, not preserved. Back with many warm russet spots. David McCadden.

At Corson's Inlet and Barnegat Pier Dr. Phillips has taken this fish. He says they are plentiful early in the season till late, and are never much over six, and mostly about three or four inches in length. It is occasionally eaten, though the flesh is not as firm eating as that of the tautog. It is a great bait-stealer.

Tautoga onitis (Linnæus).

Tautog.

Several taken about the old wreck and pilings at Ocean City September 10th, 1908. They are fine pan fish when small. They are mostly skinned when prepared as food.

Dr. Phillips has taken this at Corson's Inlet, Barnegat Pier, Longport and Ocean City. It is a good food-fish. He has seen examples of four pounds weighed at Corson's Inlet, and had reports of one eight pounds from Townsend's Inlet. They usually run two to two and one-half pounds.

Family BALISTIDÆ.

Balistes carolinensis Gmelin.

Trigger Fish.

An example twelve and one-quarter inches long was taken on a hook and line at Ocean City on September 7th, 1908. The spots on dorsal, anal and caudal were deep violet, though towards margins of these fins they faded out to grayish. Some similar on base of pectoral. Also faint bluish spots and vermiculations on back. Iris dull gray-brown. David McCadden.

Family OSTRACIIDÆ.

Lactophrys triqueter (Linnæus).

Trunk Fish. Bull Fish.

Head $2\,^1/_{10}$; depth $1\,^2/_3$; D. 9; A. 9; P. 11; greatest width of body $1\,^1/_3$ in its length; greatest depth of body $1\,^1/_3$; snout 2 in head; eye $2\,1/8$; interorbital 1.

Body shaped almost orbicular generally, upper and lower surfaces convex, greatest depth nearly midway in length, and profiles similarly convex, that of upper bulging more posteriorly and of lower more anteriorly. Back with a high trenchant keel, beginning a little before middle in length of body and continued to dorsal origin. Sides of body constricted concavely. Lower surface convex. Edges of body otherwise not especially carinated, convex. Caudal peduncle small.

Head large, deep, laterally compressed with concave sides, upper and lower surfaces a little convex, anterior upper profile steep, though more inclined than lower. Muzzle bluntly convex, rather short. Snout deep, sides constricted concavely, profile slightly and evenly convex. Eye large, rounded, high, near upper edge of head posteriorly in its length. Teeth small, uniserial, convex, not numerous, and simple. Lips apparently tough. A slight groove sloping down from before front of eye anteriorly, and nostrils inconspicuous. Interorbital space broad, depressed a little convexly, and slight convexity rising out behind towards dorsal keel.

Gill-opening small and inconspicuous above base of pectoral.

Body encased in a bony cuirass made up of hexagonal plates. On upper surface and sides they form ridges fashioned as rhombs, and these becoming mostly smaller on head. Lower surface of body perfectly smooth.

Dorsal small, posterior, its base entirely before that of anal, and anterior rays longest, edge of fin rounded. Anal little larger than dorsal, similar, and inserted directly behind base of latter. Caudal small, oblong. Pectoral largest of fins, elongate, and upper rays longest. Vent close before anal, rather large.

Color of dried example mostly uniform dull brownish generally, center of each hexagonal plate deep brown. Iris pale slaty. Fins dull brown. Teeth deep horny-brown.

Length 19 millimeters, or a trifle over three-quarters of an inch.

The above is the only example I have ever seen. It was taken at Grassy Sound, in Cape May county, on September 18th, 1904, by Mr. Jacob Miller, and kindly presented to me by Mr. R. F. Miller, of Philadelphia. None of the fishermen to whom it was shown could identify it. One called it a young "bull fish." None of them seemed to be acquainted with it. It was caught in a live-box.

Family TETRODONTIDÆ.

Lagocephalus lævigatus (Linnæus).

Rabbit Fish.

One taken at Sea Isle City on July 1st, 1908. W. J. Fox. Another was also taken somewhere on our coast during the past summer, but its data was not preserved.

Spheroides maculatus (Schneider).

Puffer.

Dr. Phillips says it is common in warm weather at Corson's Inlet, takes the hook, and reaches about six inches in length.

Family DIODONTIDÆ.

Chilomycterus schœpfi (Walbaum).

Burr Fish.

Dr. Phillips says it was seen this year at Corson's Inlet, and taken on the hook. It reaches eight inches in length, is thought to be rare by the fishermen, and lives a long while out of water.

Family COTTIDÆ.

Myoxocephalus æneus (Mitchill).

Sculpin.

Dr. Phillips reports three seen at Corson's Inlet this year, and it was said to have been common during the past summer. It is taken in the bait-net on the sandy beaches. This is the first definite record for this species on the coast of New Jersey.

Family TRIGLIDÆ.

Prionotus carolinus (Linnæus).

Sea Robin.

Probably the most common species at Corson's Inlet. Dr. Phillips says it is regarded as a pest when fishing for king fish. It is plentiful every summer. They croak when hauled in the boat. Not seen over eight inches.

Family PLEURONECTIDÆ.

Lophopsetta maculata (Mitchill).

Window Light.

Seen at Corson's Inlet in summer, according to Dr. Phillips. They reach about a foot, though usually smaller, and are eaten.

Paralichthys dentatus (Linnæus).

Summer Flounder.

Dr. Phillips says it is common at Corson's Inlet, sometimes extremely so. Caught by trolling the bullhead minnow and clams. They run quite large, occasionally up to four pounds.

Family SOLEIDÆ.

Achirus fasciatus Lacépède.

Sole.

Mr. Emlen Martin reports one taken in the Rancocas Creek, at Centerton, Burlington county, some years ago.

Two examples were taken in the Delaware River, at Newbold's Island, Burlington county, on August 13th, 1908. They were scarcely one and one-half inches or more in length. Color mostly translucent brownish on the colored side, the pale side a livid grayish. When taken they were very inactive, and were found clinging to stones.

Mr. J. B. Vanderveer says the "flounder" is occasionally taken in the Delaware tidewater, but not above Trenton.

Family OPHIDIIDÆ.

Rissola marginata (De Kay).

Sand Cusk.

Dr. Phillips says they are caught in the bait-net at Corson's Inlet. They soon bury themselves in "live" sand, tail first. Though not used as food, they are considered among the best bait for rock bass. More were caught last year and this year than ever before, generally one or two at every haul.

Family AMMODYTIDÆ.

Ammodytes americanus De Kay.

Sand Lance.

Five examples secured at Ocean City on September 7th, 1908, the largest seven inches long. Reported to be very abundant, and many found on the sand by Mr. D. McCadden. Found abundant on September 10th, though mostly of small size, and many devoured by blue fish.

Dr. Phillips says that at Corson's Inlet it is used as bait for rock, and reaches about eight inches in length.

Family BATRACHOIDIDÆ.

Opsanus tau (Linnæus).

Oyster Fish.

Color when fresh, pale olive-brown, generally paler below, and tinted with salmon-pink on breast and throat. Head above finely mottled and speckled with very fine numerous markings of dusky-olive. Some also on base of pectoral. Side of head and flanks with brownish specks. Trunk with dusky to blackish vermiculations and blotches. Vertical fins and pectoral like back, becoming terra-cotta to ochraceous tinted towards margins, and all barred with dusky. Spinous dorsal mottled. Rayed dorsal with broad bands, somewhat irregular, and sloping down behind. Caudal with five transverse bands, outer broadest, and also broad dark band on caudal peduncle at base of fin. Anal with pale, rather narrow and ill-defined bands obliquely up behind. Pectoral with about seven or eight transverse narrow bands, irregular towards base of fin, and distal ones broader. Ventral pale salmon or pinkish. Iris gray-brown, narrow dull gilt circle around slaty pupil. Length eight and three-quarter inches. Ocean City. September 7th, 1908. David McCadden. Also three more examples.

Dr. Phillips says it is not rare at Corson's Inlet. It is caught along muddy banks when fishing for small sea bass. Runs about six inches in length.

Family GADIDÆ.

Microgadus tomcod (Walbaum).

Tom Cod.

Reported to Dr. Phillips at Corson's Inlet, though not seen.

Phycis regius (Walbaum).

Hake.

Dr. Phillips says it was common at Corson's Inlet during last June, though not used as food.

Family MERLUCCIIDÆ.

Merluccius bilinearis (Mitchill).

Whiting.

Mr. David McCadden secured an example on July 26th, 1908, in Great Egg Harbor Bay, at Ocean City, Cape May county.

Family LOPHIIDÆ.

Lophius piscatorius Linnæus.

Angler.

Dr. Phillips says he has seen it in the pound at Atlantic City.

2. Notes on New Jersey Amphibians and Reptiles.

In preparing this account I am especially indebted to Mr. W. D. W. Miller, of the American Museum of Natural History in New York, for notes about Plainfield, and to Mr. C. Few Seiss, of Philadelphia, who has kindly placed at my disposal an account of his collections. To this I have added my own notes and those of several others who have kindly contributed information and material.

Family AMBYSTOMIDÆ.

Ambystoma opacum (Gravenhorst).

Blotched Salamander.

Mr. W. D. W. Miller says it is scarce about Plainfield, Union county.

Ambystoma punctatum (Linnæus).

Spotted Salamander.

Mr. Miller also found this salamander scarce about Plainfield.

Family PLETHODONTIDÆ.

Hemidactylium scutatum Tschudi.

Four Toed Salamander.

Mr. Miller says it is not common about Plainfield.

A small example was obtained at Cape May, Cape May county, during the middle of July, by Mr. O. H. Brown. This is the first

record of the occurrence of this species in the southern part of the State I have. The specimen is now preserved in the collection of the Academy of Natural Sciences of Philadelphia.

Plethodon erythronotus (Green).

Red Backed Salamander.

Mr. Miller says it is abundant about Plainfield.

Mr. C. Few Seiss has both the red and the gray forms from High Bridge, in Hunterdon county.

Plethodon glutinosus (Green).

Sticky Salamander.

Mr. Miller says it is locally abundant about Plainfield, especially in the trap ridges, though entirely absent from certain areas.

Mr. Seiss has it from High Bridge and vicinity, in Hunterdon county.

Spelerpes bislineatus (Green).

Two Lined Salamander.

Mr. Miller found it abundant about Plainfield.

Mr. Seiss has it from Hunterdon county.

Spelerpes longicauda (Green).

Long Tailed Salamander.

Mr. Miller says it is common, about water, along the foot of the trap ridges immediately north of Plainfield.

Mr. Seiss has two specimens from Hunterdon county.

Spelerpes ruber (Daudin).

Red Salamander.

Mr. Miller found it common about Plainfield.

Mr. Seiss has it from Hunterdon county. He also obtained one example from Gloucester, in Camden county.

Family DESMOGNATHIDÆ.

Desmognathus fusca (Rafinesque).

Dusky Salamander.

Mr. Miller found it abundant about Plainfield.

Mr. Seiss has it from High Bridge, in Hunterdon county.

Family PLEURODELIDÆ.

Diemictylus viridescens (Rafinesque).

Newt.

According to Mr. Miller, it is common about Plainfield.

Mr. Seiss has both the olive and red forms from High Bridge.

Family BUFONIDÆ.

Bufo americanus Holbrook.

Toad.

Mr. Miller says but one form of toad, most likely this species, is abundant about Plainfield.

At Burlington, Burlington county, on April 26th, 1908, they were very vociferous.

Many newly-hatched tadpoles, evidently this species, were found in

Sluice Creek, tributary of Dennis Creek in Cape May county. No adults seen. May 10th, 1908.

Mr. Seiss has it from High Bridge, also Gloucester and Camden in Camden county and Atlantic City in Atlantic county.

Several seen about Ocean City, in Cape May county, on September 10th, 1908.

Family HYLIDÆ.

Pseudacris triseriatus (Wied).

Swamp Tree Toad.

Mr. Miller says it is rather abundant about Plainfield in Union county, judging by the spring chorus, but so inconspicuous after the song season that he met with but two or three until this time. These specimens he says were preserved.

Acris gryllus crepitans (Baird).

Cricket Toad.

Mr. Miller reports it common about Plainfield.

Two found at Franklinville, in Gloucester county, on April 17th, 1908.

Several in pools about Repaupo, in Gloucester county, on April 19th, 1908.

Abundant, and occasionally their rattling notes were heard in the beaver swamp of Sluice Creek, in Cape May county, on May 10th, 1908. They were associated with the frogs and were dark or blackish in color.

Mr. Seiss has it from Gloucester and High Bridge.

Hyla pickeringii (Holbrook).

Pickering's Tree Toad.

Mr. Miller says it is abundant about Plainfield.

Found in numbers in full chorus in swamps about Franklinville, in Gloucester county, on April 17th, 1908.

Abundant in chorus in all the meadows near Repaupo and Gibbstown, in Gloucester county, on April 19th, 1908.

Below Millville dam, Cumberland county, it was heard in large chorus along the Maurice River, on May 9th, 1908.

Hyla andersonii Baird.

Anderson Tree Toad.

Color, when fresh, beautiful pea-green on back and upper surfaces of limbs. This color is bounded all along its edges on head, flanks, sacral region posteriorly, tibial region and hallux, by a narrow line of pale whitish, with just a very slight tint of dilute azure in some places. On femoral region this pale boundary-line is not evident. From nares, to and including eye, back towards axilla, a deep indigo-black streak or band, this not wider than vertical diameter of eye, and sharply and conspicuously evident, especially being due to pale narrow boundary-lines. These blackish bands do not extend across tip of nose. Edge of upper jaw paler green all around. At axilla indigo-black band becomes a beautiful lavender-gray, which extends well back in bright color toward groin, but not to latter. Just little above axilla it sends forward a narrow dark grayish-lavender branch, which widens out into broad dusky-lavender or neutral tint of throat or vocal vesicle. Edges of lower lip slightly, though rather broadly, pale violet or purplish all around to greenish patch, which begins about opposite front part of eye. Greenish of upper surface of fore limbs is thus completely separated from that of back, and is bordered with a fine or narrow pale line all around, which at shoulder assumes a slightly bluish hue. Breast livid pale lavender, papillæ larger or more whitish, though all annectant colors fuse gradually into it. Hand above dull prussian-blue, and this color not sharply demarked from bright orange-red of hand below, which latter color is also brightest in the first two fingers. In fact, bluish of upper surface of hand is largely superiorly external, only extending over outer half, and in the basal joint of the third finger and nearly whole of upper surfaces of the fourth finger. The two inner fingers are brilliant orange-red. Bluish of hand above extends along forearm to elbow, behind narrow yellowish-green line separating green above. On lower surface of forearm it fades beautiful violet, and next to yellowish-green

line turns somewhat dusky. Posterior humeral region and lower front surface of forearm bright gamboge-brown, blotched and spotted with most brilliant orange. These spots rather small on wrist and in axilla, also rather dull on former and very bright on latter, and at posterior humeral region rather large. On orange-red of hand and fingers are many small brilliant orange dots or spots. Lower surface of hand on outside becomes somewhat brownish. Belly fades posteriorly at first through a pale gamboge or brownish into brilliant orange-red of lower surface of hind limbs. Half way along flanks, for spots are not continued to axilla, large brilliant orange spots are distributed in inguinal region, then a little more sparsely and of smaller size along front of tibial region, lower posterior surface of fibula and tibia, and then on upper surface of foot, where, of course, much smaller. Inferior tibio-fibular region with tinge of dull gamboge. From knee along anterior margin of pale line separating green of upper surface of tibio-fibular region, a blackish-indigo annectant line, narrow and soon fading into lilac and then into gamboge-orange below. Outer edge of foot superiorly and out on basal portion of fourth toe and entire upper surface of fifth toe lilac-purple. Feet otherwise orange-red, innermost digits most brilliant and most everywhere finely spotted with orange. No spots on belly and inter-femoral region, though papillæ all of paler shade. Ventral region with narrow whitish line separating greenish of back, below dusky-lilac tint, becoming more pronounced below. All these colors soon give place to green of upper surface and orange-red of lower. Iris beautiful golden, variegated with different shades to form very narrow golden circle around black pupil. Length from tip of snout to tip of outstretched fourth toe, three and a half inches. Received by Mr. J. W. Holman, through Mr. J. A. G. Rehn, from Stafford's Forge, in Ocean county, April 29th, 1908. Another, with the same data, was also received on September 18th, 1908.

Hyla versicolor Le Conte.

Common Tree Toad.

Mr. Miller says it is common at Plainfield.

Family RANIDÆ.

Rana pipiens Schreber.

Leopard Frog.

A small blackish tadpole, evidently the young of this species, was taken in Goshen Creek, near Goshen, Cape May county, on January 5th, 1908.

Mr. Miller says it is not very common about Plainfield.

Several bright green examples were found about South Dennis, in Cape May county, on May 10th, 1908. All had the markings on the back very distinct. They would jump into the water as one approached, and were quite conspicuous by their green color.

Mr. Seiss has it from Camden and Gloucester.

Rana virgatipes Cope.

Sphagnum Frog.

This interesting frog was heard frequently calling in the sphagnum bogs of Sluice Creek, a tributary of Dennis Creek, below South Dennis in Cape May county, on May 10th, 1908. They were evidently in the height of their breeding. A pair found in copula had the axillary type of embrace, the male of course mounted above in the usual position. The sexes showed little difference in color, the female, however, usually appearing more swollen or obese, if not a trifle large. The frogs exhibited all the characteristics of those found in Mare Run, in 1904. They were equally retiring in their habits, and could be distinguished among the submerged vegetation only when one happened to move, which is always very slight in its disturbance to the water, or happened to be near when calling. The name, "cluck-cluck" was used rather vaguely by some people to distinguish them from the other species. Mr. H. Walker Hand reports he is positive that he has heard this species near Cape May City, among the fresh marshes or ponds. Its occurrence there would not be altogether unexpected.

Rana catesbeiana Shaw.

Bull Frog.

Mr. Miller says it is somewhat common and local or restricted about Plainfield.

One seen in Little Timber Creek, Delaware Basin, near Coopers, in Gloucester county, on April 19th, 1908.

Mr. Seiss has it from High Bridge and Camden.

Rana clamata Daudin.

Green Frog.

Mr. Miller says it is abundant at Plainfield.

Several frogs, evidently this species, were heard about Franklinville, in Gloucester county, on April 17th, 1908.

Found about Porchtown, in Gloucester county, on April 17th, 1908. Both adults and tadpoles were seen.

Found at Repaupo, in Gloucester county, on April 19th, 1908.

Several found about the lake at Millville, in Cumberland county, on May 9th, 1908. One nearly full grown, and the small tadpoles seen were also most likely this species.

Mr. Seiss has it from High Bridge and Gloucester.

Rana palustris Le Conte.

Pickerel Frog.

Mr. Miller found it common about Plainfield.

Mr. Seiss has it from High Bridge and Gloucester.

Rana sylvatica Le Conte.

Wood Frog.

Mr. Miller found it common about Plainfield.

Mr. Seiss has it from High Bridge.

Family COLUBRIDÆ.

Regina leberis (Linnæus).

Leather Snake.

Mr. Seiss has it from Hunterdon county.

Natrix sipedon (Linnæus).

Water Snake.

Mr. Miller says this and the garter snake are the most abundant species about Plainfield.

A large example taken at Beverly, in Burlington county, on May 2d, 1908, by Mr. S. Scovell.

One found at the head of Millville Lake, in Cumberland county, on May 9th, 1908.

Found in Sluice Creek near South Dennis, in Cape May county, on May 10th, 1908. They were all dull with obscure markings above. The several individuals seen were swimming about the sphagnum, and probably had plenty of food in the frogs. They were about two feet in length.

Mr. Seiss has it from Hunterdon county, and Gloucester, in Camden county, where it was seen in many places.

Storeria occipito-maculata (Storer).

Red Bellied Snake.

Mr. J. A. G. Rehn tells me he saw an example of this species taken at Hammonton, in Mullica township, Atlantic county, by Stephen Milstead, Sr., in March, 1908.

Color, in life, deep dusky-brown on back, inclining nearly to blackish, and head above rather more brownish. On nape of neck three pale ochraceous blotches of warm buff conspicuous, one median superiorly and each of others lateral. Several pale obscure specks on head above. A pair of median obscure dusky lines, rather well

separated, down middle of back. Along sides, just above gastrosteges, a dusky line extending back, though becoming obsolete on posterior half of body, and marked above and below by a series of small buffy spots along its entire length. Lower surface of head grayish with a few dusky specks along side. Lower surface of trunk and tail deep brick-red. Length five inches. Taken at Stafford's Forge, in Ocean county, on June 12th, 1908, by Mr. J. W. Holman.

Storeria dekayi (Holbrook).

De Kay's Brown Snake.

Mr. Miller says it is apparently not common about Plainfield. Mr. Seiss has it from Hunterdon county.

Genus VIRGINIA Baird and Girard.

The Virginia Snakes.

Virginia valeriæ Baird and Girard.

Blaney's Snake.

Scales smooth, about fifteen in transverse dorsal series. Gastrosteges one hundred and twenty to one hundred and thirty. Anal plate divided. Color grayish, in life, with minute black dots, often in two rows. Below yellowish. Length twelve inches.

Known from our limits only by Mr. W. D. W. Miller's observations. He says he has found several specimens, all under boards or stones, in woods on the trap ridges immediately north of Plainfield. South of this region the species is apparently not found. Though I have never seen any specimens, Mr. Miller informs me that he has one adult specimen preserved. This is the first occurrence of the species in New Jersey so far as I am aware, and its distribution is usually given as no further north than Maryland and Delaware.

Diadophis punctatus (Linnæus).

Ring Necked Snake.

Mr. Miller says it is locally common about Plainfield, chiefly in the trap ridges.

Mr. Seiss has it from High Bridge.

Coluber constrictor Linnæus.

Black Snake.

According to Mr. Miller it is common about Plainfield.

One taken near the head of Millville Lake, in Cumberland county, on May 9th, 1908, by Mr. Samuel Scovell. It was found in a tree along the edge of a swamp. Eyes appeared reddish, throat and chin whitish.

Thamnophis sauritus (Linnæus).

Ribbon Snake.

Mr. C. J. Hunt secured two examples near Pensauken, in Camden county, on March 15th, 1908. The larger was about twenty inches in length. After keeping them in captivity some time they were killed. They would not take any food. They refused to eat ordinary garden slugs or snails. In disposition they were very gentle and mild, and did not resist when handled, though were easily frightened.

Mr. Miller says it is a common species about Plainfield.

Mr. Seiss has it from Hunterdon county, and Mount Holly, in Burlington county.

Thamnophis sirtalis (Linnæus).

Garter Snake.

Mr. Miller says it is the most abundant snake about Plainfield. All apparently belong to one sub-species, having the dorsal stripe always present and usually very distinct.

Mr. Seiss has it from Camden, Gloucester and Hunterdon county.

Lampropeltis getulus (Linnæus).

Chain Snake.

Mr. W. P. Seal says he has observed it at Tomilson's Mills.

Lampropeltis doliatus triangulus (Boie).

House Snake.

Mr. Miller says it is common about Plainfield. He thinks the prevailing, if not the exclusive form, is *triangulus,* as his single preserved specimen is this rather than *clericus.* I have not seen his material.

Heterodon platyrinos (Latreille).

Hog Nose Snake.

Mr. C. J. Hunt found it at Brown's Mills, in Burlington county, in 1906, and Belle Mountain, in Mercer county, on September of 1907.

Mr. Miller says it is apparently not very common about Plainfield.

Large example taken at Beverly, in Burlington county, on April 2d, 1908, by Mr. Samuel Scovell. This specimen would very readily feign death when irritated or annoyed, by rolling over on its back, relaxing as if dead, and even allowing its tongue to hang out.

One taken near the head of Millville Lake, in Cumberland county, on May 9th, 1908. It was found in a rather waste, sandy place. It also feigned death after being annoyed.

Mr. W. P. Seal says he has seen it near Delair and Woodbury.

Mr. Seiss has it from Bay Head, in Ocean county, and Atlantic City.

Mr. C. H. Connor secured it at Union Mills, on October 11th, 1908.

The example noted in Rep. N. J. State Mus., 1907 (1908), p. 198, was obtained at Stafford's Forge, in Ocean county, by Mr. J. A. G. Rehn, on April 21st, 1907.

Family CROTALIDÆ.

Agkistrodon contortrix (Linnæus).

Copper Head Snake.

Mr. C. S. Williamson reports one killed near Newfoundland, in Morris county, in July of 1905, and another on a mountain near Green Pond, Morris county, in July of 1907.

Mr. Miller says it is common in the trap ridges immediately north of Plainfield, but absent south of these hills.

Mr. Seiss has an example, which was seen swimming across a pond and killed when it landed, at High Bridge, in Hunterdon county.

Crotalus horridus Linnæus.

Rattle Snake.

Mr. Williamson reports two killed near Milton, Morris county, in 1904, and also two at the same place in 1905.

The example I reported several years ago, taken in 1900, in a swamp near Goshen, was reported to Mr. H. Walker Hand as having been nearly five feet long. Mr. Hand was, however, unfortunately unable to verify this statement as he did not see the specimen himself. Two other individuals were also said to have been killed there at the same time.

Family IGUANIDÆ.

Sceloporus undulatus (Latreille).

Pine Tree Lizard.

Mr. Seiss has it from Bay Head, in Ocean county.

Family CHELONIDÆ.

Genus COLPOCHELYS Garman.

The Bastard Turtles.

Colpochelys kempi Garman.

Hawksbill Turtle. Bastard Turtle.

This species is very closely related to the loggerhead turtle, and seems to have first been definitely noticed from our shores by Dr. O. P. Hay. In an elaborate paper he points out the difference between it and the loggerhead. He says that "it seems doubtful whether any of the external characters that have been mentioned by Garman and Coker as distinguishing this species from the loggerhead are applicable in all cases," though it is very different osteologically. He records a stuffed and dried specimen taken at Atlantic City and now in the United States National Museum, and a skull found on the coast of New Jersey, now in the American Museum of Natural History in New York.

Colpochelys kempi Hay, Proc. U. S. Nat. Mus., XXXIV, 1908, pp. 183–198, Pls. 6–11.

Family CHELYDRIDÆ.

Chelydra serpentina (Linnæus).

Snapping Turtle.

Mr. Miller found it common about Plainfield.
Mr. Seiss has it from Hunterdon county and Camden.

Family KINOSTERNIDÆ.

Kinosternon pensylvanicum (Gmelin).

Mud Turtle.

Mr. Seiss has it from Anglesea, in Cape May county.

Sternothœrus odoratus (Latreille).

Musk Turtle.

Mr. Miller reports it as common about Plainfield.
Mr. Seal says it occurs at Delair.
Mr. Seiss has it from High Bridge.

Family EMYDIDÆ.

Malaclemys centrata concentrica (Shaw).

Diamond Back Terrapin.

Mr. Seiss reports he saw one in the marshes at Atlantic City, about 1884.

Pseudemys rubriventris (Le Conte).

Red Bellied Terrapin.

Mr. Seal says he has met with it at Tomilson's Mills.

Chrysemys picta (Schneider).

Painted Terrapin.

Mr. Miller says it is abundant about Plainfield.
Mr. Seal met with it at Tomilson's Mills and Delair.
Mr. Seiss has it from Camden, and High Bridge, in Hunterdon county.

Clemmys muhlenbergii (Schœpff).

Muhlenberg's Terrapin.

Mr. Miller reports it common about Plainfield.

Clemmys insculpta (Le Conte).

Wood Tortoise.

Mr. Miller says it is rather common about Plainfield.

Mr. Seiss has two half-grown examples from High Bridge.

Clemmys guttata (Schneider).

Spotted Terrapin.

Mr. Miller says it is rather abundant about Plainfield.

Mr. Seal reports having seen it at Brown's Mills, in Burlington county.

Mr. Seiss has it from High Bridge and Gloucester.

Terrapene carolina (Linnæus).

Box Tortoise.

Shell found in Crooked Creek, near Cape May Court House, Cape May county, on January 5th, 1908.

Mr. Miller says it is rather abundant about Plainfield.

One found near South Dennis, in Cape May county, on May 10th, 1908. It was rather dull yellowish with obscure dusky markings.

Mr. Seiss has it from Hunterdon county, and Jamesburg, in Middlesex county.

Messrs. Stone and McCadden found two examples at Beesley's Point, on August 15th, 1908. One had crimson eyes.

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PLATES

From Audubon.

HORNED GREBE. **Colymbus auritus** Linn.

From Audubon.

PIED-BILLED GREBE. **Tachybaptus podiceps** (Linn.).

From specimen in State Museum.

LOON. Gavia immer (Brünn.).

From specimens in State Museum. 1 2

1. BONAPARTE'S GULL. Larus philadelphia (Ord.).
2. HERRING GULL. Larus argentatus Pont.

From Audubon.

COMMON TERN. Sterna hirundo Linn.

From Audubon.

LEACH'S PETREL. Oceanodroma leucorhoa (Vieill.).

From specimens in State Museum.

BROWN PELICAN. **Pelecanus occidentalis** (Linn.).

From Audubon.

MERGANSER. Mergus americanus Cassin.

From Audubon.

WOOD DUCK. Aix sponsa (Linn.).

From Audubon.

CANVAS-BACK. **Marila vallisneria** (Wilson).

From specimen in State Museum.

CANADA GOOSE. **Branta canadensis** (Linn.).

From specimens in State Museum.

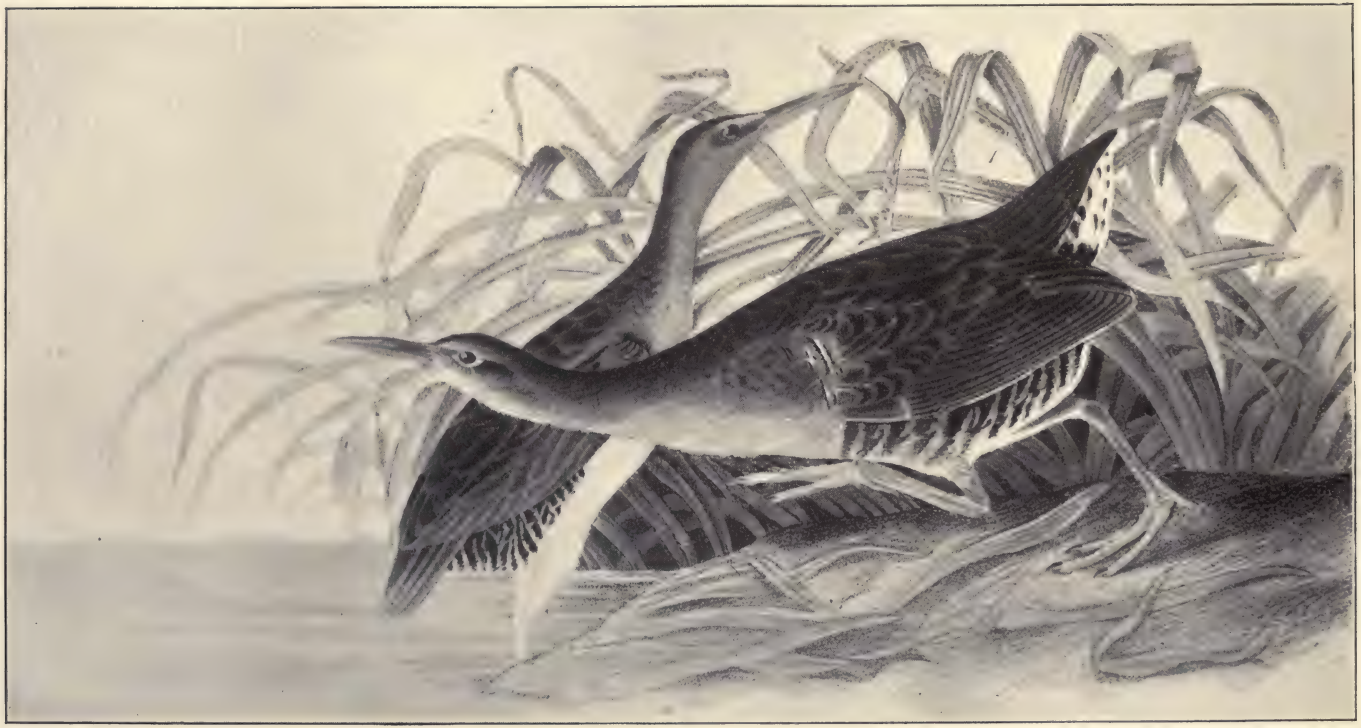
GREAT BLUE HERON. Ardea herodias Linn.

From photograph furnished by Nat. Asso. Aud. Soc.

EGRET. Herodias egretta (Gmel.).

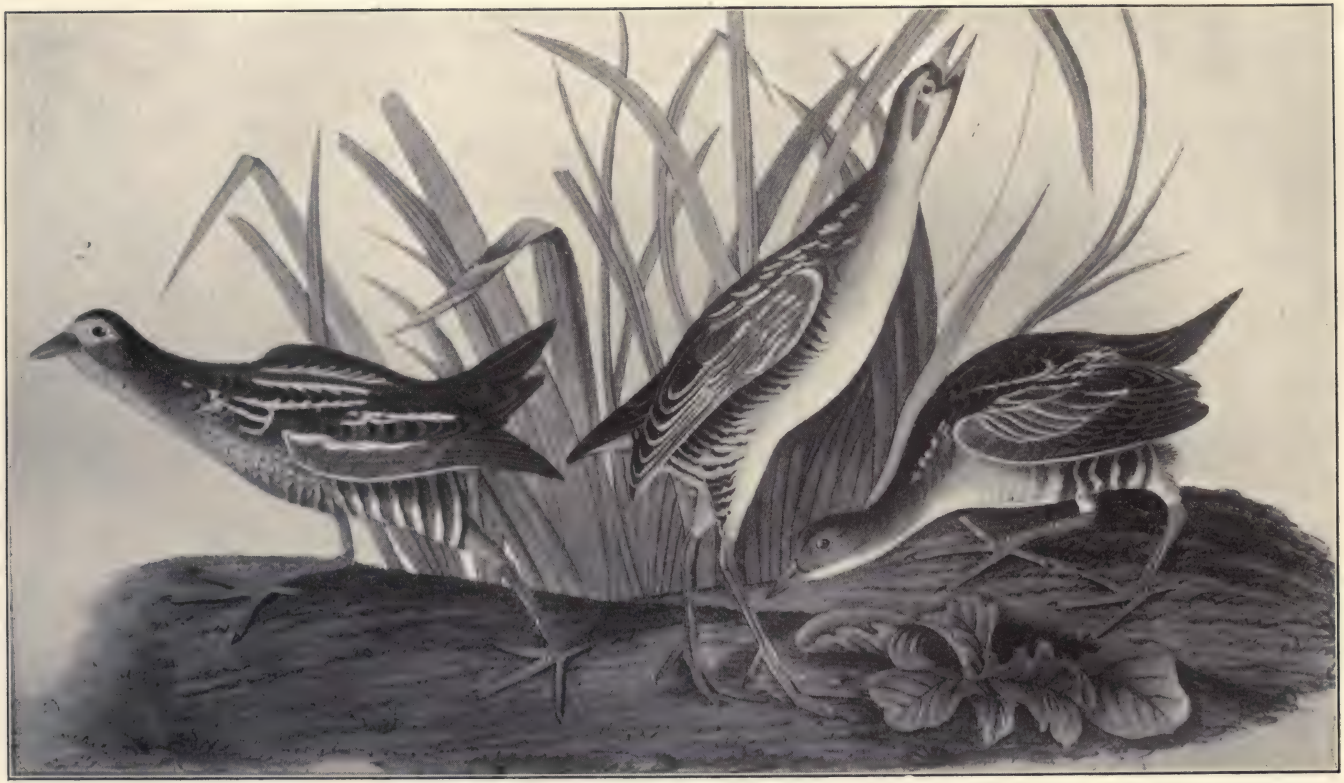
From Audubon.

BLACK-CROWNED NIGHT HERON. Nycticorax nycticorax nævius (Bodd.).



From Audubon.

KING RAIL. Rallus elegans Aud.



From Audubon.

SORA. Porzana carolina (Linn.).

From Audubon.

1. FLORIDA GALLINULE. Gallinula galeata (Licht.).
2. COOT. Fulica americana (Gmel.).

From Audubon.

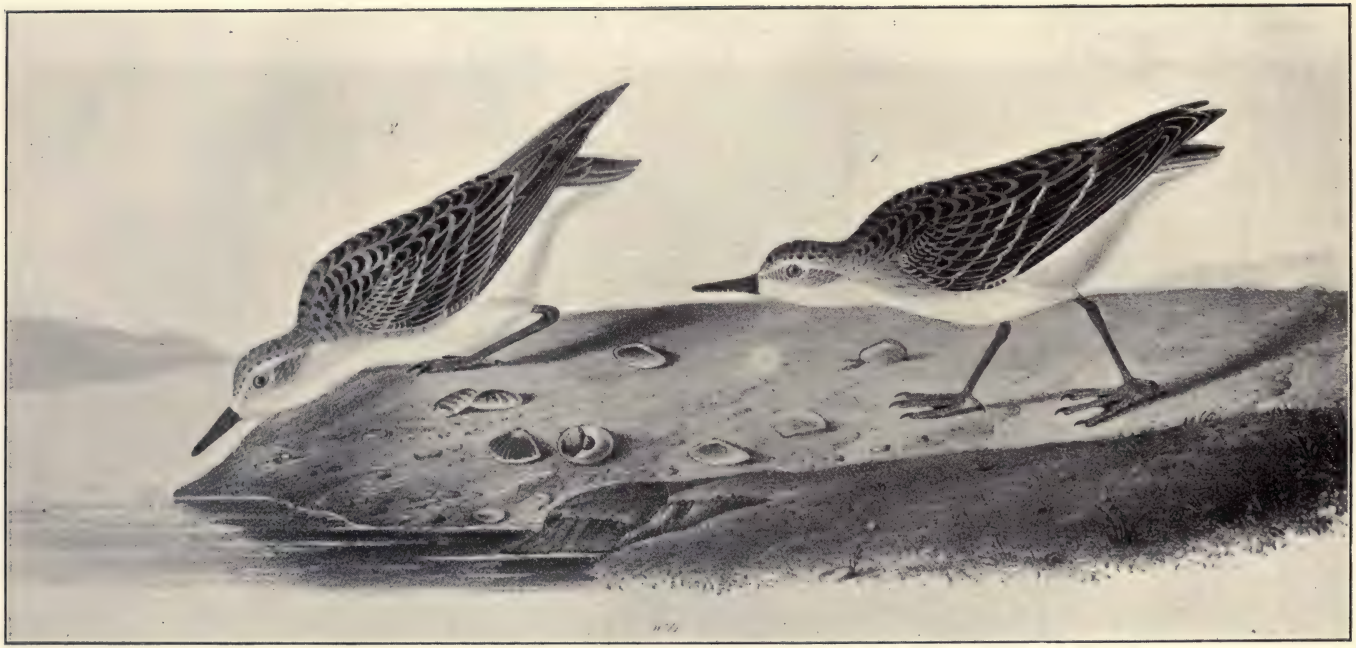
WOODCOCK. Philohela minor (Gmel.).

From Wilson.

1. **WILSON'S SNIPE.** Gallinago delicata (Ord.).
2. **BOBWHITE.** Colinus virginianus (Linn.).

From Audubon.

KNOT. Tringa canutus Linn.



From Audubon.

SEMIPALMATED SANDPIPER. Ereunetes pusillus (Linn.).

From drawing by Fuertes, Nat. Asso. Aud. Soc.

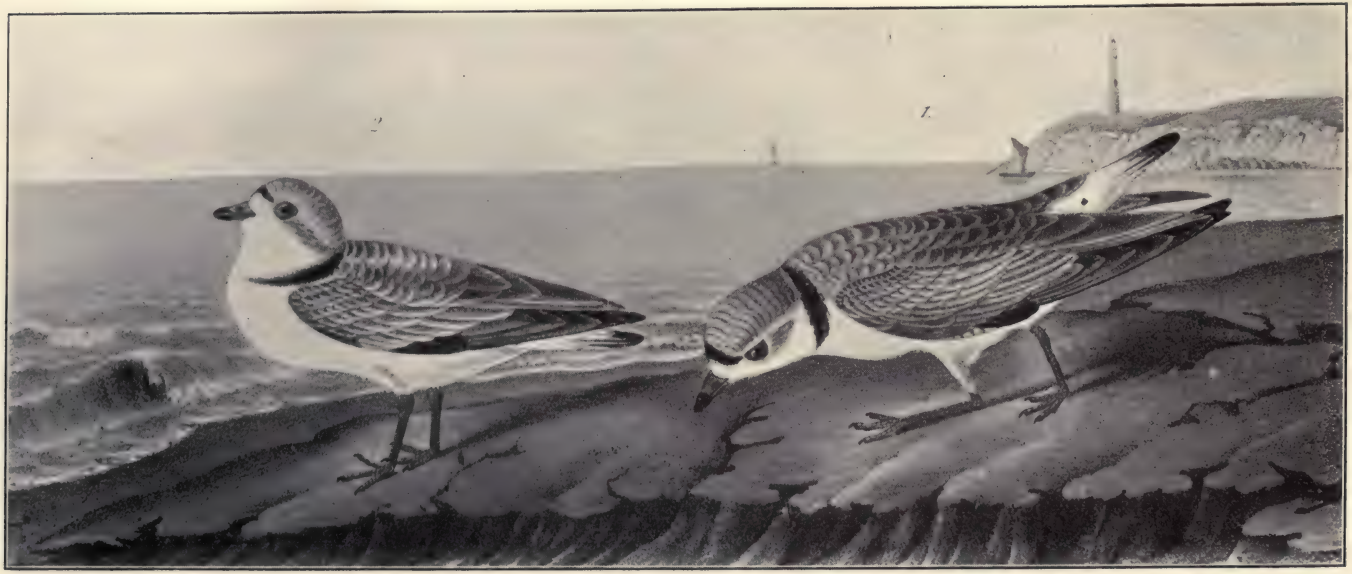
UPLAND PLOVER. Eartramia longicauda (Bechst.).

From Audubon.

SPOTTED SANDPIPER. Actitis macularia (Linn.).

From drawing by Horsfall, Nat. Asso. Aud. Soc.

KILLDEER. Oxyechus vociferus (Linn.).

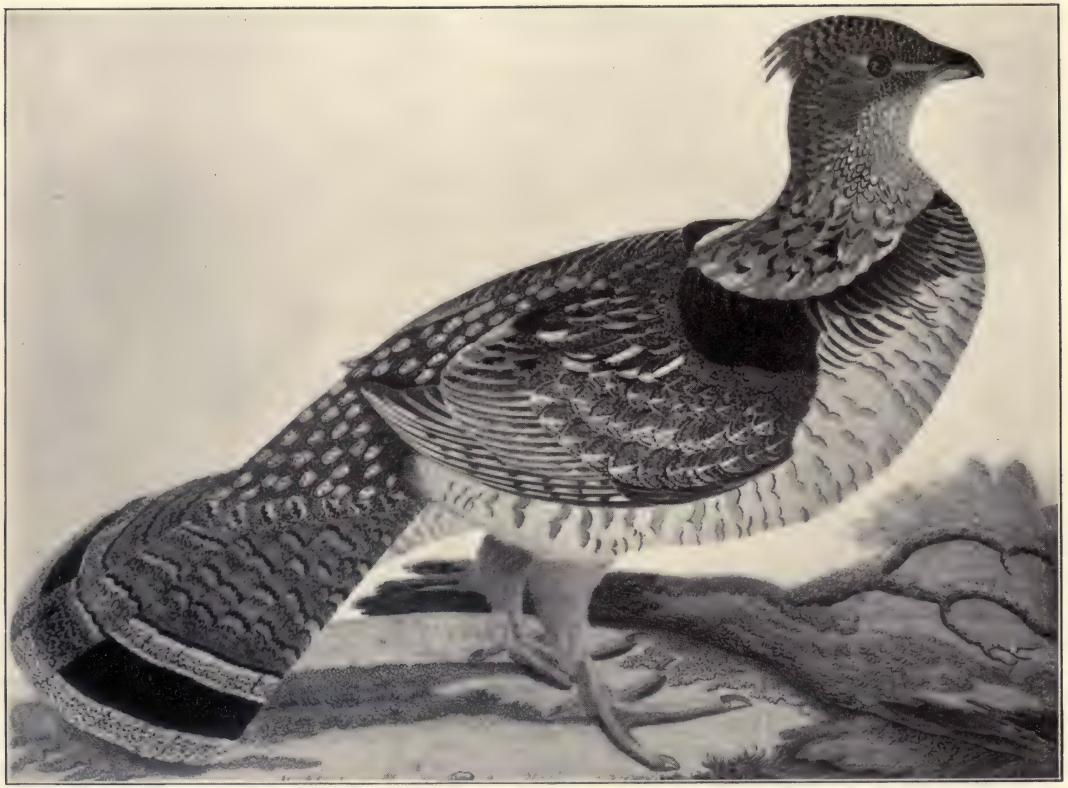


From Audubon.

PIPING PLOVER. *Ægialitis meloda* (Ord.).

From Audubon.

OYSTER-CATCHER. Hæmatopus palliatus Temm.



From Wilson.

RUFFED GROUSE. Bonasa umbellus (Linn.).

From Wilson.

WILD PIGEON. Ectopistes migratorius (Linn.).

From Wilson.

MOURNING DOVE. **Zenaidura macroura carolinensis** (Linn.).

From Wilson.

SHARP-SHINNED HAWK. Accipiter velox (Wils.).

From Wilson.

RED-TAILED HAWK. **Buteo borealis** (Gmel.).

From Wilson.

BALD EAGLE. Haliæetus leucocephalus (Linn.).

From Wilson.

SPARROW HAWK. Falco sparverius Linn.

From drawing by Fuertes, Nat. Asso. Aud. Soc.

SCREECH OWL. Otus asio (Linn.).

From Wilson.

YELLOW-BILLED CUCKOO. Coccyzus americanus (Linn.).

From drawing by Horsfall, Nat. Asso. Aud. Soc.

BELTED KINGFISHER. Ceryle alcyon (Linn.).

From Wilson.

DOWNY WOODPECKER. Dryobates pubescens medianus (Sw.).

From Wilson.

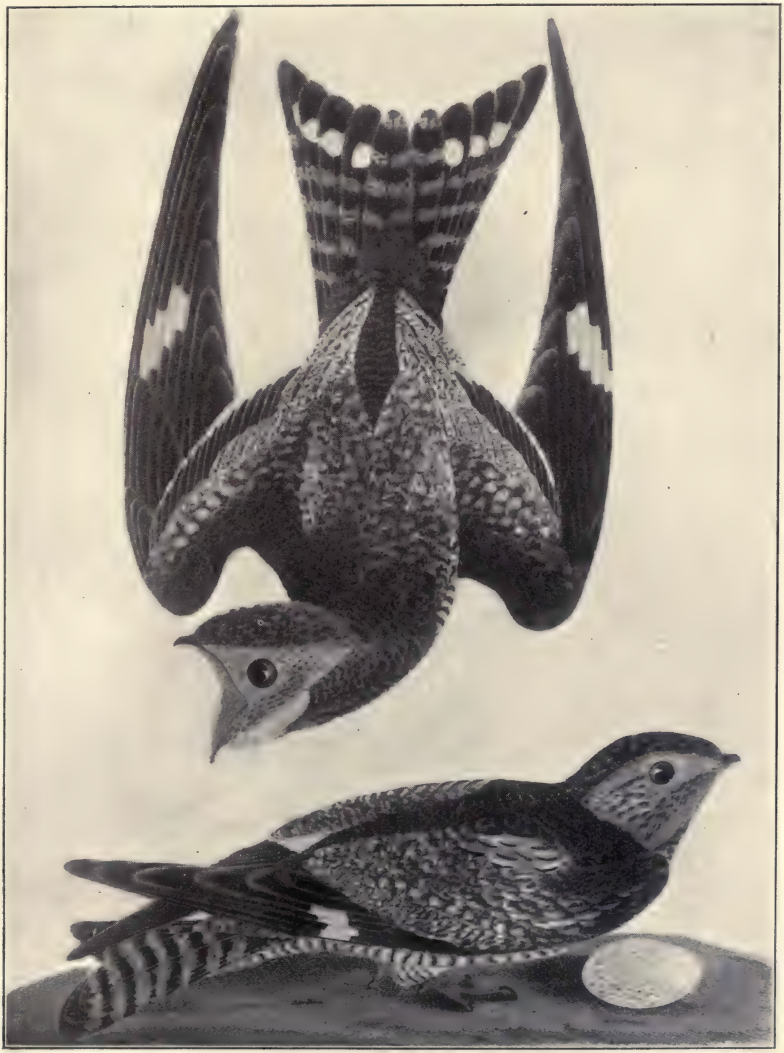
RED-HEADED WOODPECKER. Melanerpes erythrocephalus (Linn.).

From Wilson.

FLICKER. **Colaptes auratus luteus** Bangs.

From Wilson.

WHIP-POOR-WILL. **Antrostomus vociferus** (Wils.).



From Wilson.

NIGHT-HAWK. **Chordeiles virginianus** (Gmel.).

From Wilson.

CHIMNEY SWIFT. **Chætura pelagica** (Linn.).

From Wilson.

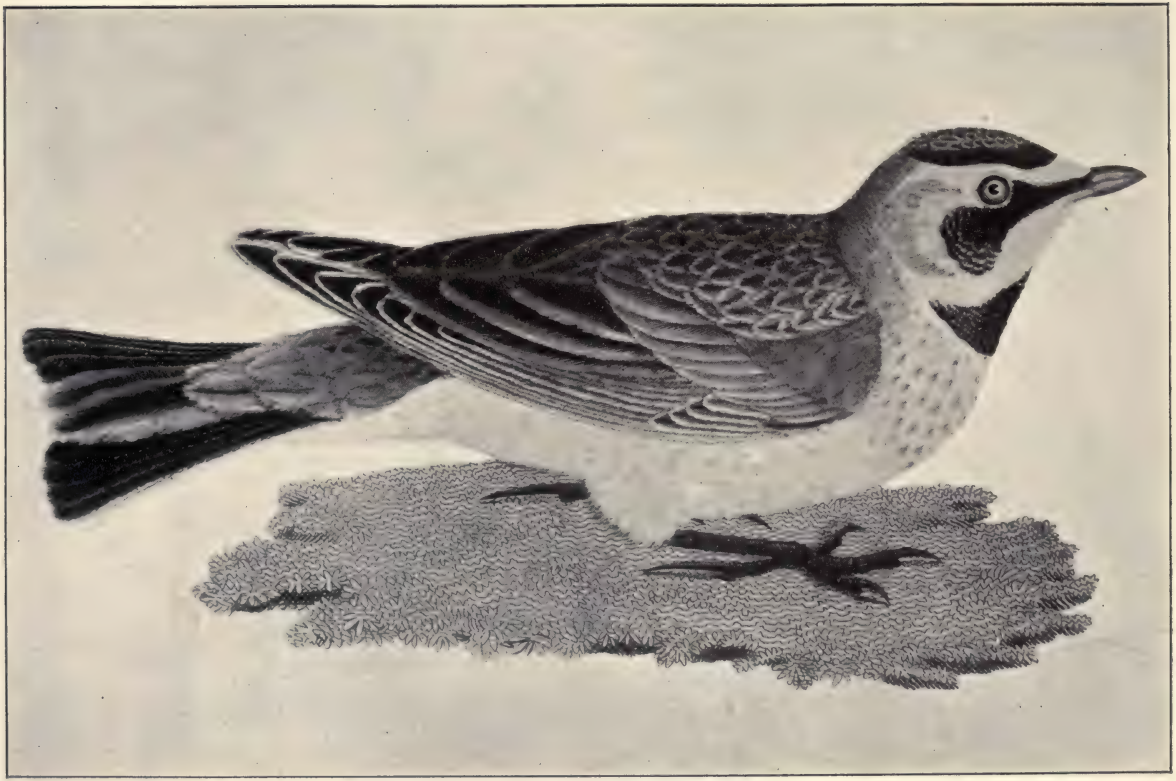
RUBY-THROATED HUMMINGBIRD. Archilochus colubris (Linn.).

From Wilson.

1. WOOD PEWEE. Myiochanes virens (Linn.).
2. KINGBIRD. Tyrannus tyrannus (Linn.).

From Wilson.

GREAT CRESTED FLYCATCHER. Myiarchus crinitus (Linn.).



From Wilson.

HORNED LARK. Otocoris alpestris (Linn.).

From drawing by Horsfall, Nat. Asso. Aud. Soc.

BLUE JAY. Cyanocitta cristata (Linn.).

From Wilson.

CROW. **Corvus brachyrhynchos** Brehm.

From Wilson.

BOB-O-LINK. Dolichonyx oryzivorus (Linn.).

From drawing by Horsfall, Nat. Asso. Aud. Soc.

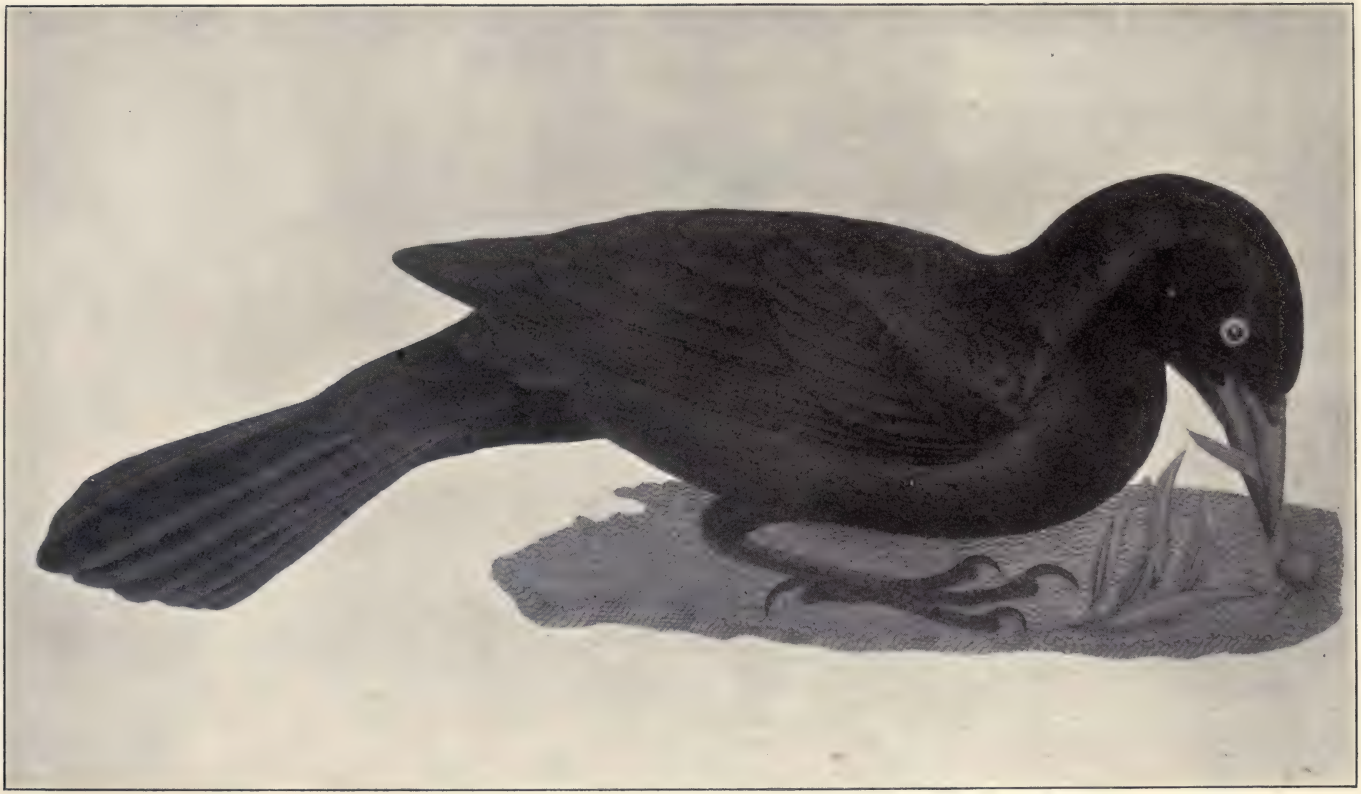
RED-WINGED BLACKBIRD. Agelaius phœniceus (Linn.).

From drawing by Fuertes, Nat. Asso. Aud. Soc.

MEADOW-LARK. Sturnella magna (Linn.).

From drawing by Horsfall, Nat. Asso. Aud. Soc.

BALTIMORE ORIOLE. Icterus galbula (Linn.).



From Wilson.

PURPLE GRACKLE. **Quiscalus quiscula** (Linn.).

From drawing by Horsfall, Nat. Asso. Aud. Soc.

CROSSBILL. *Loxia curvirostra minor* (Brehm).

From drawing by Horsfall, Nat. Asso. Aud. Soc.

GOLDFINCH. Astragalinus tristis (Linn.).

From Wilson.

1. FOX SPARROW. Passerella iliaca (Merr.).
2. WHITE-THROATED SPARROW. Zonotrichia albicollis (Gmel.).

From Wilson.

1. **FIELD SPARROW.** **Spizella pusilla** (Wils.).
2. **CHIPPING SPARROW.** **Spizella passerina** (Bechst.).

From drawing by Horsfall, Nat. Asso. Aud. Soc.

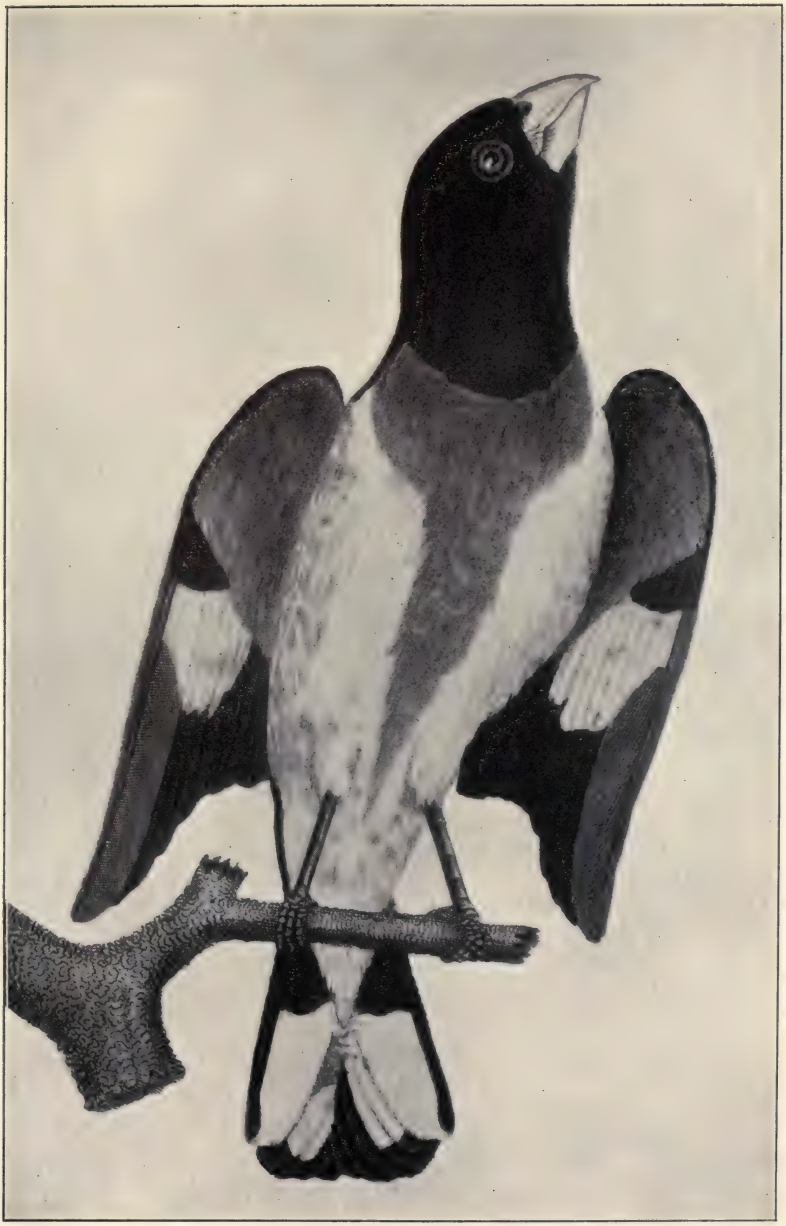
SONG SPARROW. Melospiza melodia (Wils.).

From Wilson.

TOWHEE. Pipilo erythrophthalmus (Linn.).

From Wilson.

CARDINAL. Cardinalis cardinalis (Linn.).



From Wilson.

ROSE-BREASTED GROSBEAK. Zamelodia ludoviciana (Linn.).

From Wilson.

INDIGO-BIRD. Passerina cyanea (Linn.).

From drawing by Horsfall, Nat. Asso. Aud. Soc.

SCARLET TANAGER. Piranga erythromelas Vieill.

From Wilson.

1. BANK SWALLOW. Riparia riparia (Linn.).
2. PURPLE MARTIN. Progne subis (Linn.).

From drawing by Horsfall, Nat. Asso. Aud. Soc.

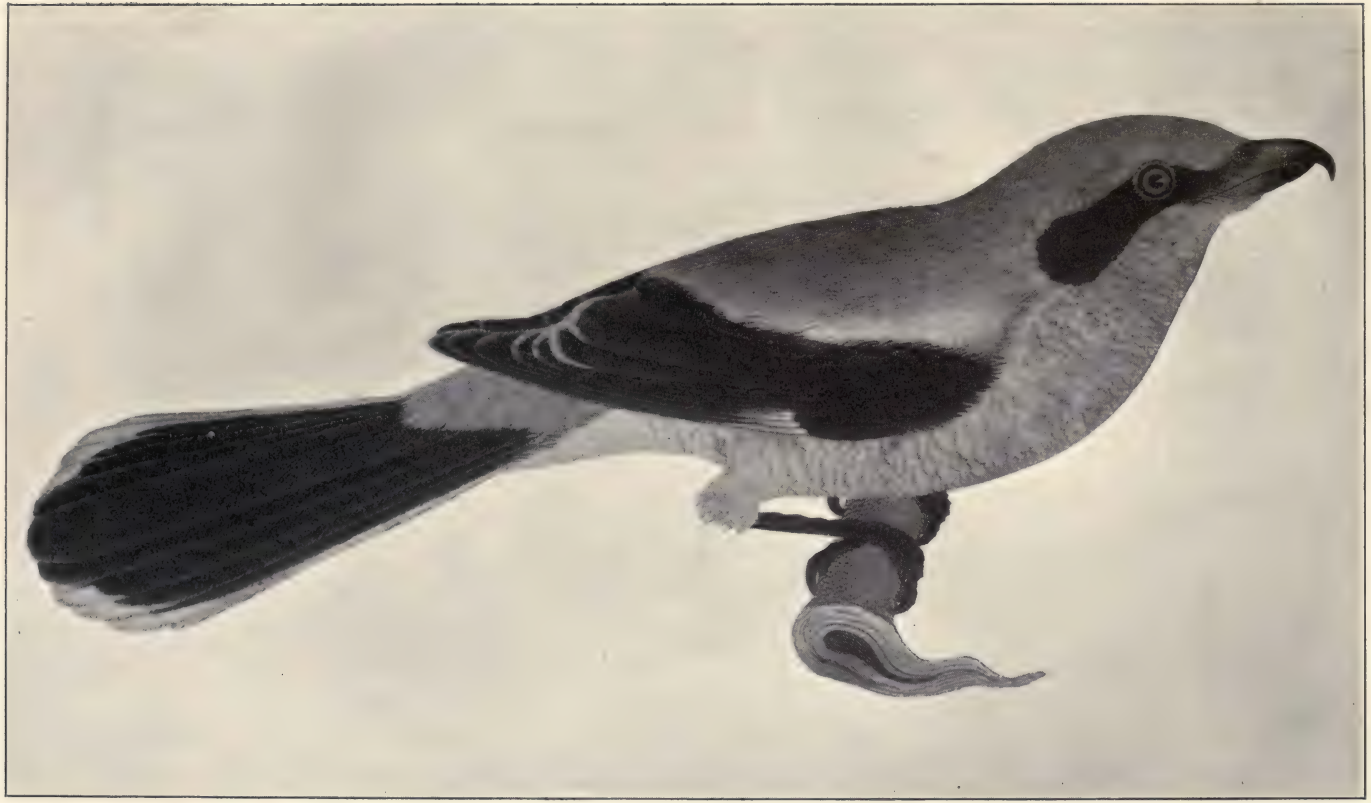
BARN SWALLOW. Hirundo erythrogastra Bodd.

From drawing by Horsfall, Nat. Asso. Aud. Soc.

TREE SWALLOW. Iridoprocne bicolor (Vieill.).

From Wilson.

CEDAR WAXWING. **Bombycilla cedrorum** Vieill.



From Wilson.

GREAT NORTHERN SHRIKE. Lanius borealis Vieill.

From Wilson.

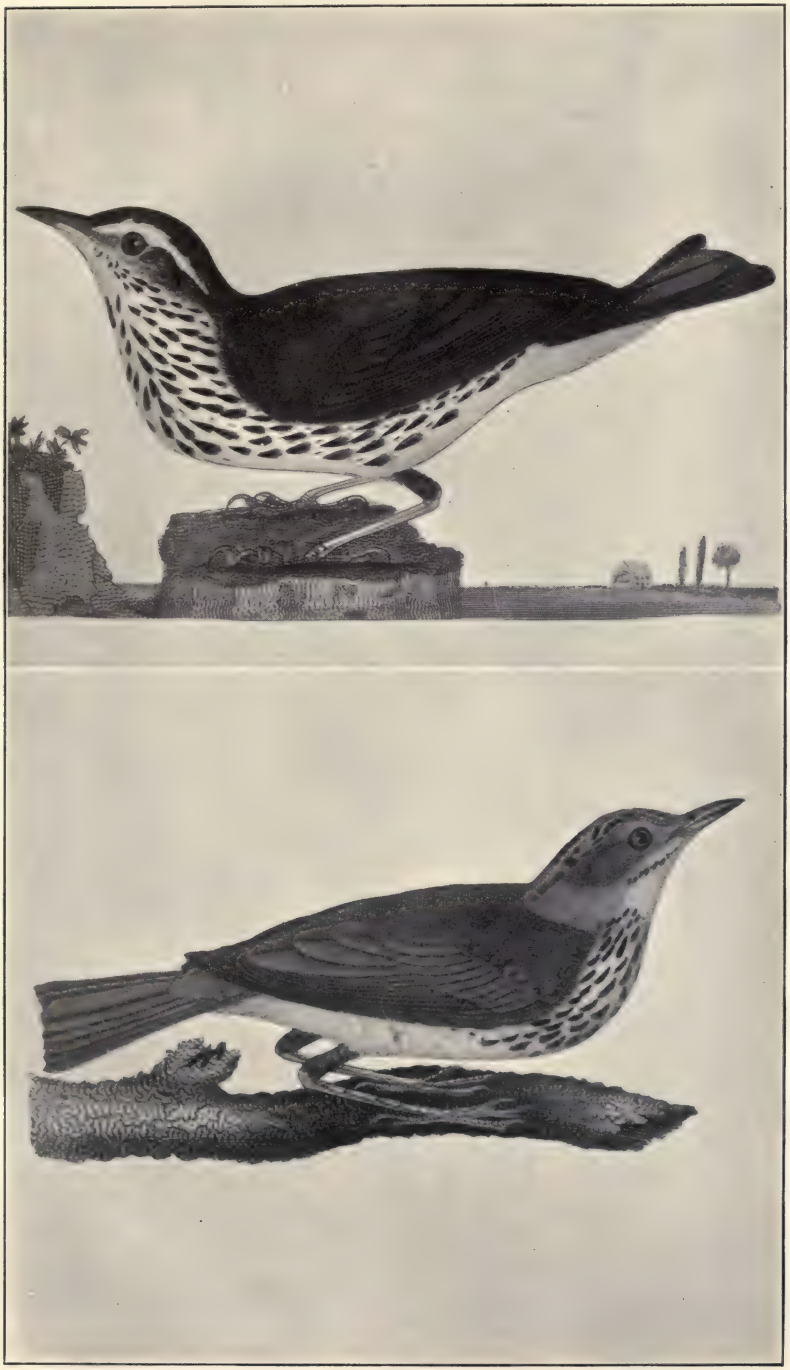
1. WHITE-EYED VIREO. Vireo griseus (Bodd.).
2. RED-EYED VIREO. Vireosylva olivacea (Linn.).

From Wilson.

1. YELLOW WARBLER. Dendroica æstiva (Gmel.).
2. PRAIRIE WARBLER. Dendroica discolor (Vieill.).

From Wilson.

1. HOODED WARBLER. Wilsonia citrina (Bodd.).
2. MYRTLE WARBLER. Dendroica coronata (Linn.).



From Wilson.

1. WATER THRUSH. Seiurus noveboracensis (Gmel.).
2. OVEN-BIRD. Seiurus aurocapillus (Linn.).

From Wilson.

1. YELLOW-BREASTED CHAT. Icteria virens (Linn.).
2. MARYLAND YELLOW-THROAT. Geothlypis trichas (Linn.).

From Audubon.

REDSTART. Setophaga ruticilla (Linn.).

From Wilson.

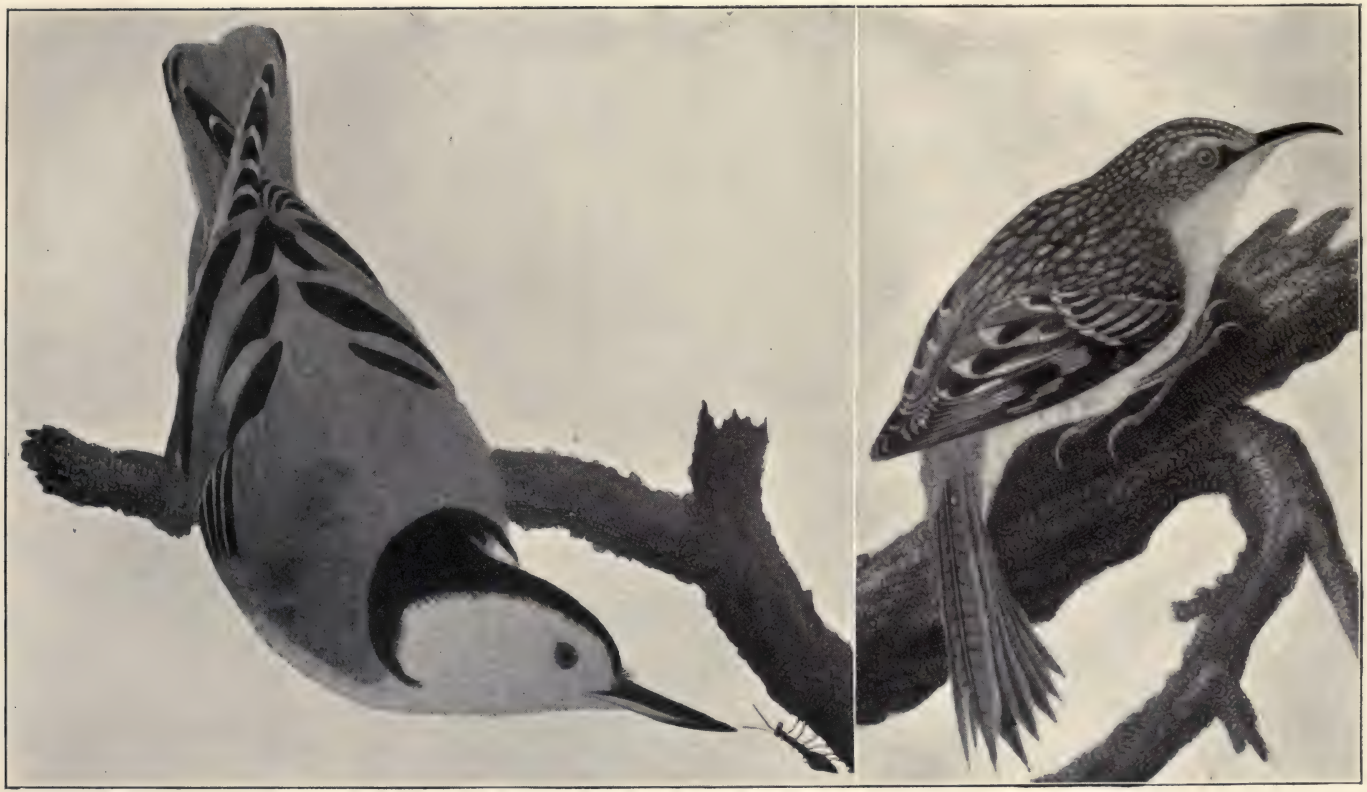
CATBIRD. **Dumetella carolinensis** (Linn.).

From Wilson.

BROWN THRASHER. Toxostoma rutum (Linn.).

From Wilson.

1. CAROLINA WREN. Thrycthorus ludovicianus (Lath.).
2. WINTER WREN. Nannus hiemalis (Vieill.).
3. HOUSE WREN. Troglodytes ædon Vieill.



From Wilson.

1. WHITE-BREASTED NUTHATCH. Sitta carolinensis Lath.
2. BROWN CREEPER. Certhia familiaris americana Bon.

From Wilson.

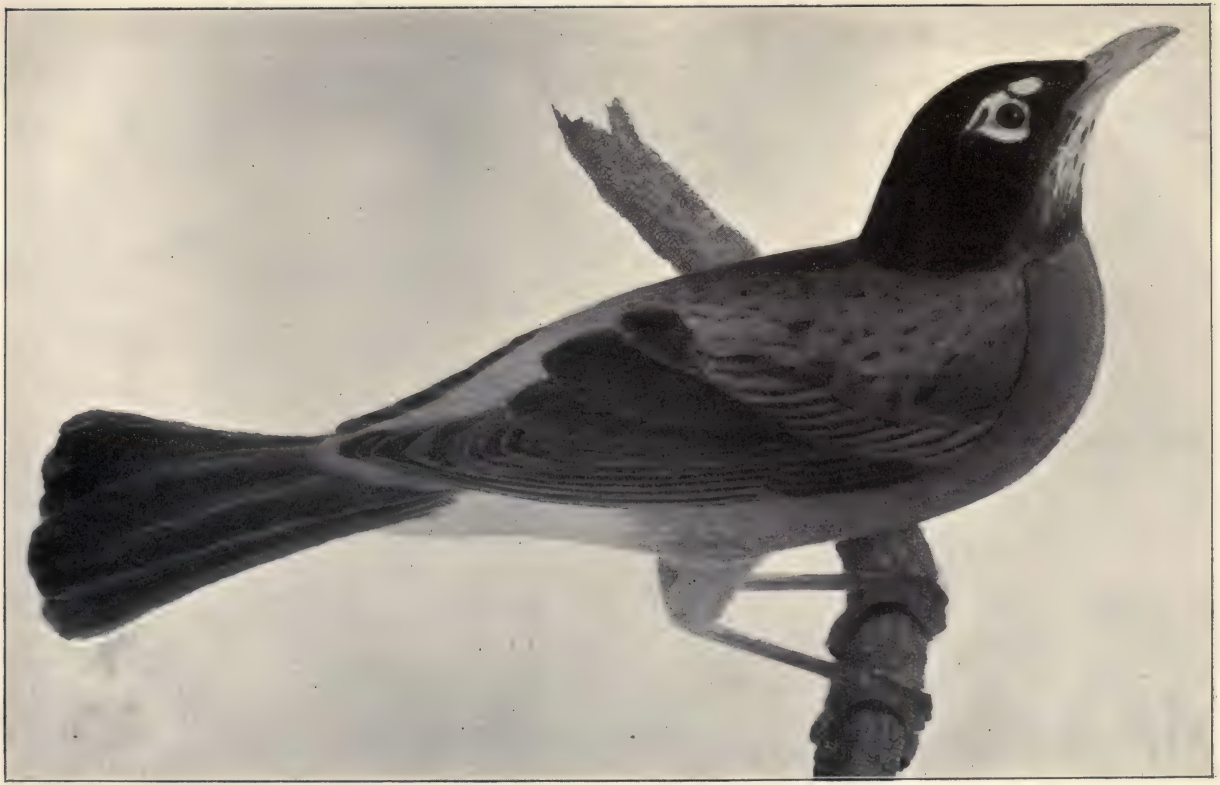
1. TUFTED TITMOUSE. Bæolophus bicolor (Linn.).
2. CHICKADEE. Penthestes atricapillus (Linn.).

From drawing by Horsfall, Nat. Asso. Aud. Soc.

1. GOLDEN-CROWNED KINGLET. Regulus satrapa Licht.
2. RUBY-CROWNED KINGLET. Regulus calendula (Linn.).

From Wilson.

WOOD THRUSH. Hylocichla mustelina (Gmel.).



From Wilson.

ROBIN. Planesticus migratorius (Linn.).

From drawing by Horsfall, Nat. Asso. Aud. Soc.

BLUEBIRD. Sialia sialis (Linn.).

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